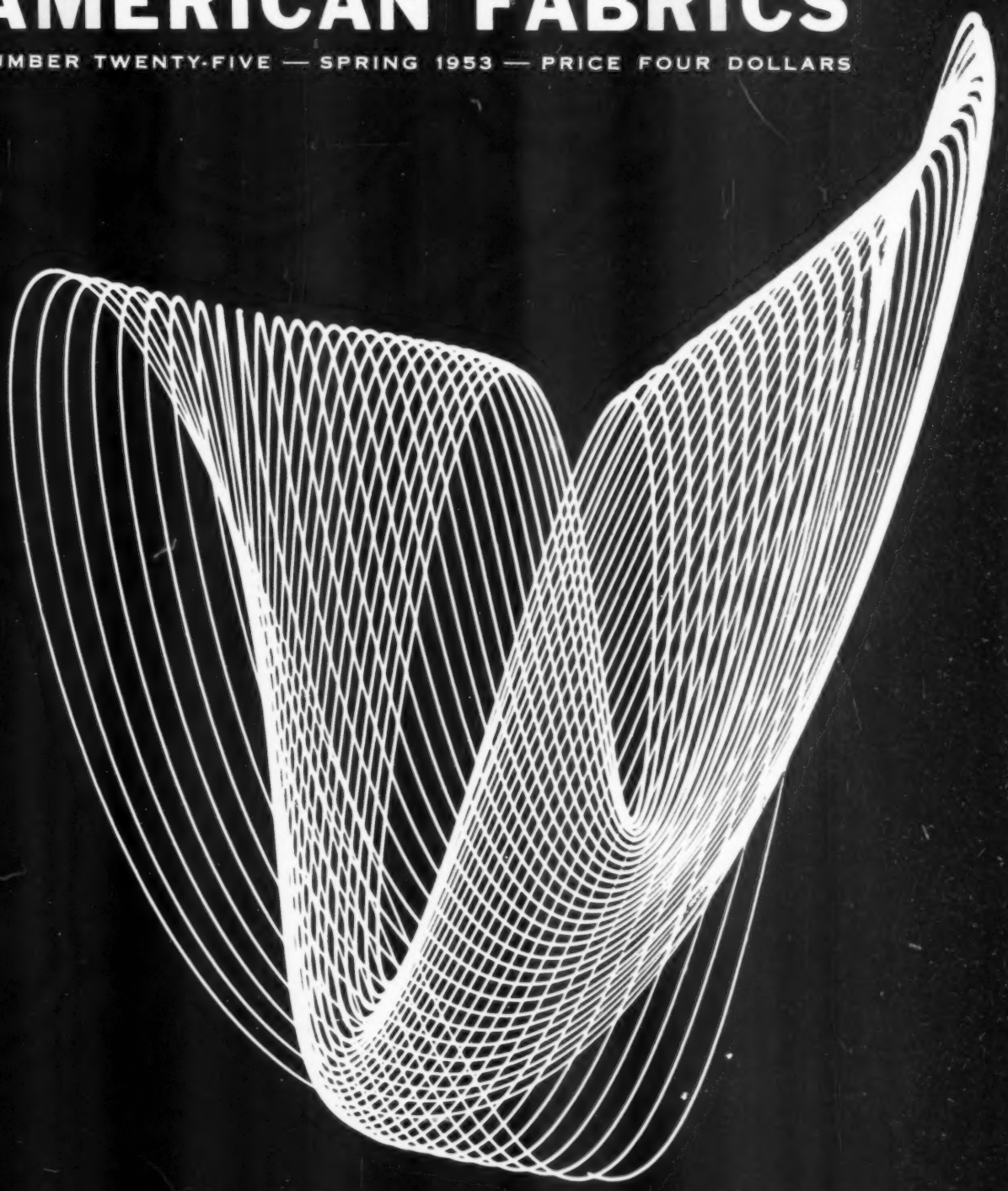
AMERICAN FABRICS

NUMBER TWENTY-FIVE — SPRING 1953 — PRICE FOUR DOLLARS



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American Fabrics

. . . dedicated to the belief that Fashion begins with the Fabric . . . that the American textile industry casts a major influence on the economic and social aspects of the world in which we live and that it has deservedly attained the world's pinnacle from which it can never be dislodged. This volume number twenty-five of American Fabrics focuses its editorial spotlight on a series of new blends representing a major trend in fashion fabrics, and on several important developments in textile techniques. With this number American Fabrics also inaugurates a special new section devoted to industrial fabrics and materials.

Board of Editors: Dr. George E. Linton, Cora Carlyle, Howard Ketcham, Alvin Lustig, Estelle K. Silvay, Capt. J. A. Murdocke, R. Bissing. Art Editors: W. Lully, Harry Hering, Albert Greenberg. Staff Photographer: Joshua M. Weiner. Vice-president and Advertising Manager: Joseph C. Stein. Ass't Advertising Manager: Tone Vallee. Business Mgr.: C. I. Rohrlich. Circulation Mgr.: Marc Ross. Ass't to Publisher: Christopher Fremantle. Publisher: Wm. C. Segal.

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Number 25

Spring, 1953

American Fabrics

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RAYON CRÊPE HARBINGER OF SPRING

A fabric newly light to the touch, light on your figure — with a richness that molds magnificently. It's Bloomsburg's "Arbella" of Avisco "Minifil" rayon and acetate yarn, in David Levine's sinuous silhouette . . . lovely now under furs, fresh-blooming for the coming season. DePinna, New York; Bonwit Teller, Philadelphia; Sakowitz Bros., Houston; Ransohoffs, San Francisco.

Avisco®

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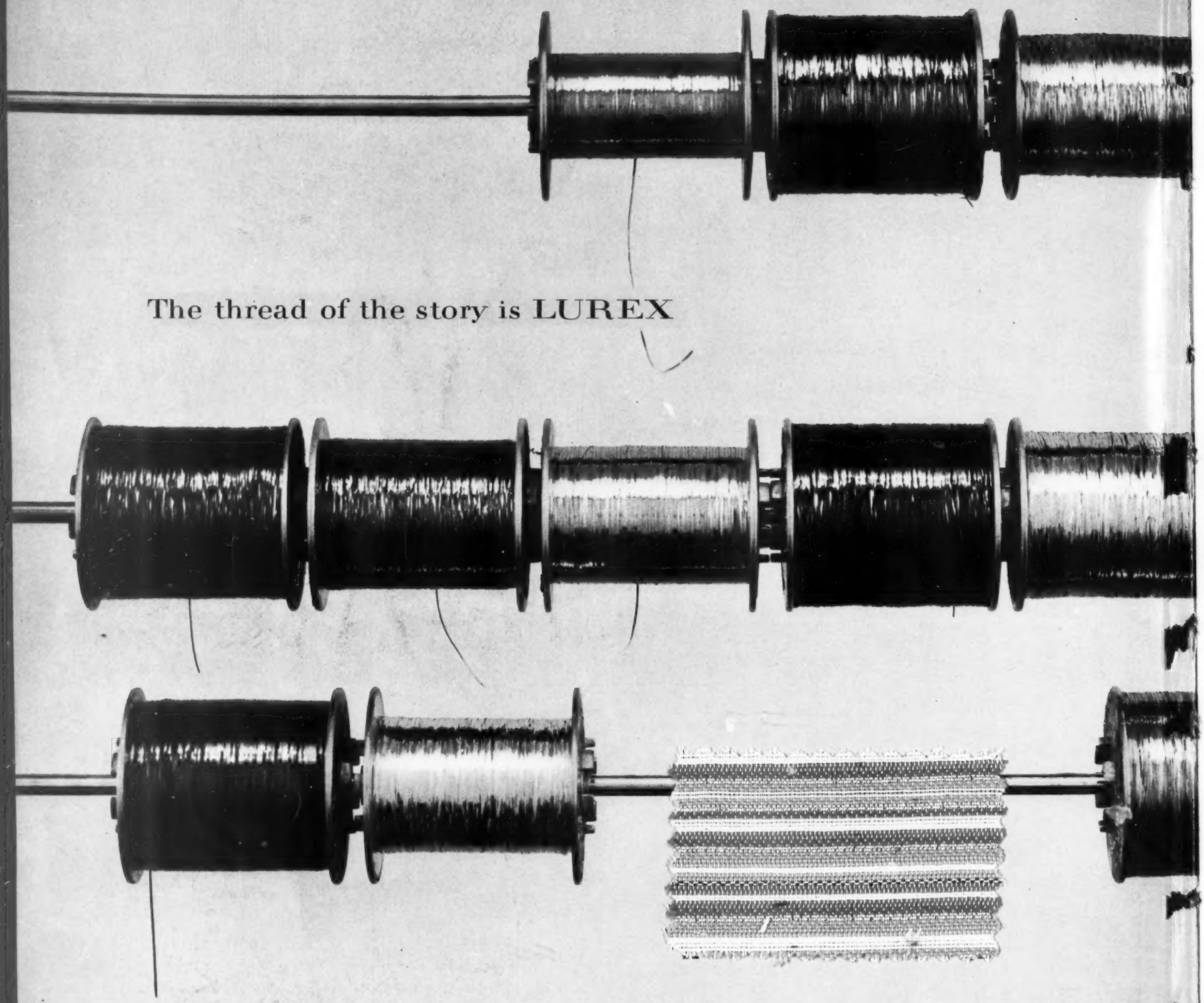

The thread of the story is LUREX

Lustre of Lurex® in cottons for Fall. The fabric sampled is typical of a large new collection by Herbert Meyer, combining cotton with gold, silver or black Lurex. Lurex, non-tarnishing metallic yarn, made only by ***The Dobeckmun Company, Cleveland 1, Ohio . . . New York: 250 West 57th Street***


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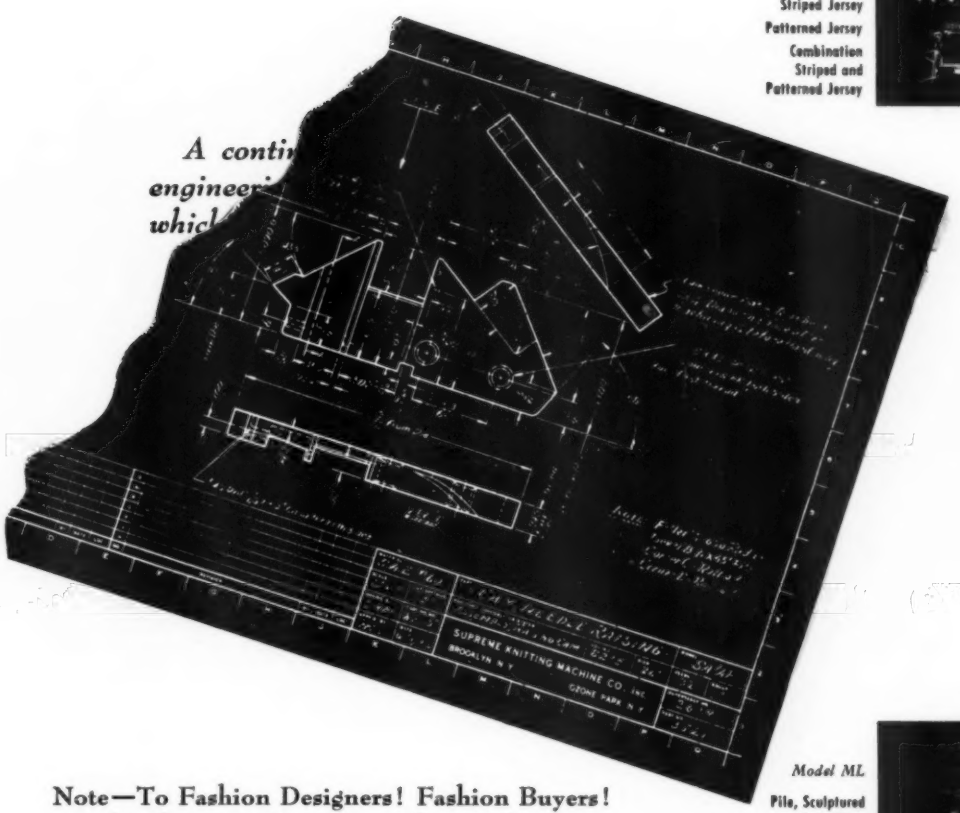
ENKA RAYON

RICHARD AVEDON

A Ben Reig Design—sapling slim dress in
Onondaga's Newbark, an interesting new weave.
Newbark is woven with Enka Rayon yarn and wool.
Bonwit Teller, New York; Scruggs-Vandervoort-Barney, St. Louis
Frost Bros., San Antonio; I. Magnin, California-Seattle

AMERICAN ENKA CORPORATION, 206 MADISON AVE., NEW YORK 16, N. Y.

What's behind Supreme's blueprint for knit fabric progress . . .



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Model LT/SAAF

Four Color Striped Terrys
Shaggy Looped Terry
Fine Looped Terry

Model SAAF

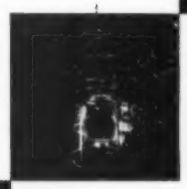
Variable Striped Jersey
Patterned Jersey
Combination Striped and Patterned Jersey

Model LRP

"Vent-Knit" Mesh Patterns

Model SR

Plain Rib
Swiss Rib



Model ROF

Jacquard-Type Floatless Patterns

Model MJ

Body Size Jersey
Wide Striped Jersey

Model ML

Pile, Sculptured Loop-Terry and Plush

Model IC

Fleeces
Coatings

Note—To Fashion Designers! Fashion Buyers! Merchandisers! Ask your supplier to show you Supreme-knit fabrics in cotton, wool and synthetics, such as the wonderful fluffy 4-color striped knit terry... the beautiful, breeze-cooled "Vent-Knit"... pattern-placed jersey, etc. Or write direct to Supreme for free sample swatches. Remember, too, that Supreme welcomes your suggestions for new types of knit fabrics which would have consumer appeal.

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SK-163

ENKA RAYON

RICHARD AVEDON

A Ben Reig Design—sapling slim dress in
Onondaga's Newbark, an interesting new weave.
Newbark is woven with Enka Rayon yarn and wool.
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AMERICAN ENKA CORPORATION, 206 MADISON AVE., NEW YORK 16, N. Y.

What's behind Supreme's blueprint for knit fabric progress . . .

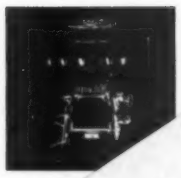
A continuing program of creative engineering to develop the machines which knit the fabrics the public wants.

Model LT/SAAF

Four Color Striped Terrys

Shaggy Looped Terry

Fine Looped Terry



Model SAAF

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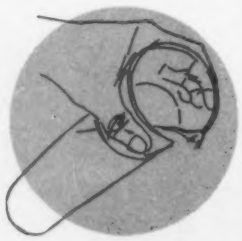
SILK

WOOL



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THE PEOPLE WHO ARE RESPONSIBLE for DECISIONS BASED on TEXTILE KNOWLEDGE

A look into the circulation files of* AMERICAN FABRICS, *together with an analysis of classifications of readers.

Many of our friends have expressed agreeable surprise when they chanced to come upon American Fabrics subscribers not only in the high places of manufacturing and retailing, but in places where they did not expect to find American Fabrics. People have told us of seeing copies in the homes of heads of many of the country's greatest corporations . . . in the libraries, classrooms, and reference rooms of leading universities and training schools . . . in foreign countries on every continent. To bring to life in numbers the vibrant, vital readership and influence of American Fabrics is difficult. But the following analysis, we believe, can be useful to those who wish to get an all-over view of America's key textile publication. In presenting these figures, we have felt it necessary to present a few accompanying comments on an audience which is responsible for making the major textile buying decisions in this country.

In the retail field
. . . 6,007

American Fabrics is read and studied by 6,007 retailers, merchandise managers, buying executives, store presidents, and training department executives in some of the finest and largest retail and department stores of America. For many of the larger stores from three to twenty yearly subscriptions are entered. A cross-section of American Fabrics subscribers in retail establishments includes: *Lord and Taylor, Saks Fifth Avenue, Neiman-Marcus, Bullock's, J. L. Hudson, L. S. Ayres, Marshall Field, Filene's, Jordan Marsh, Higbee, Wanamaker, Auerbach's, Miller and Rhodes, Halle Brothers, W. & J. Sloane, Roos Brothers, Frost Brothers, McCutcheon, Crowley Milner, Macy's, Hartzfelds, The May Company, Famous-Barr, Stix, Baer & Fuller, Scruggs-Vandervoort, Shillito's, Kresge, Joseph Horne, Gimbel Brothers, Frederick & Nelson, Davison-Paxon, Bonwit Teller, Hess Brothers, Lerner Stores, Rogers Peet, Brooks Brothers, Z.C.M.I., Abraham & Straus, Howard Stores, City of Paris, J. W. Robinson, I. Magnin, Eaton of Toronto, Lane Bryant,* in fact every important store without exception.

In the field of fashion manufacturing
. . . 5,480

American Fabrics is read, studied, and guides the buying decisions of some 5,480 top manufacturers of men's, women's, and children's apparel. A cross-section of American Fabrics subscribers in fashion manufacturing includes: *Philip Mangone; Maurice Rentner; Handmacher; Jantzen; Henry Rosenfeld; Duchess Royal; Kaylon Company; Cluett Peabody; David Crystal; Baker Clothes; Printz Biederman; Wragge; Strutwear; Munsingwear; Alligator Company; Hart, Schaffner & Marx; Reliance Manufacturing Co.; Society Brand Clothes; Richmond Brothers; Wembley; Palm Beach; Hathaway Shirts; Marlboro Manufacturing; Forest City Manufacturing; John B. Stetson; Gottfried Company; Kickernick Company; Farrington Manufacturing; Adelaar Blouses; Rhea Manufacturing; Jamison; Junior House; Manhattan Shirts; Kenneth Tischler; Rosenau Brothers; Higginbotham, Bailey and Logan; Susquehanna Waist; Baumann Brothers; M. & D. Simon; Louis Tabak; Donnelly Garment Co.; Gernes Garment Co.; Lang Kohn; Justin McCarty; Nardis; Lorch; American Golfer; Ben Zuckerman; Mary Muffet; Beau Brummell; Harford Frocks; Dede Johnson; Carolyn Schnurer; Phillips-Jones; Shirtcraft; Clopay Corp.; Craig Manufacturing; Catalina; Witty Bros.; Ben Reig; A. Stein & Company; United Garment; Warner Foundations; Barclay Manufacturing; Laskin Mouton; Gautner & Mattern; Koret of California; Brittany; Levi Strauss; Artistic Foundations; Bracken and Levin; Burmel Handkerchief; Damon Creations; Hoover Manufacturing Company; Sherman Brothers Rainwear.*

In addition American Fabrics has been repeatedly called first choice among all publications with many top designers and decorators. The following great designing names are included among our subscribers: *Dorothy Draper, Dorothy Liebes, Carolyn Schnurer, Bonnie Cashin, Philip Mangone, Adele Simpson, Maurice Rentner, Bob Fatherly, Anne Fogarty, Pahlmann, Kiviette, Bernard Newman, Tina Leser, Claire McCardell, Alex Colman, Montesano, Jo Copeland, Hannah Troy, Howard Greer, Larry Aldrich, Sophie of Saks Fifth Avenue, Brigance, Clare Potter.*

In the field of industry,
. . . 2,221

American Fabrics is read, studied, and guides the textile decisions of executives in 2,221 major companies, including: *American Radiator Corp., Grace Lines, U. S. Steamship Lines, General Motors, Chrysler Motors, Ford Motor Car Co., Studebaker, Kaiser-Fraser, Cessna Aircraft, Radio Corporation of America, Weirton Steel, Bostonian Shoes, Stewart-Warner Corp., Carborundum Co., Chesapeake & Ohio Railway Co., Esso Standard Oil Co., Armstrong Cork Co., General Shoe Corp., B. F. Goodrich Co., U. S. Steel Corp., Dunlap Tire & Rubber Corp., General Tire Co., Glenn L. Martin Co., Bendix Aviation, Grumman Aircraft Corp., Eastern Airlines, The Pullman Co., Fairchild Aircraft, White Motor Co., Briggs Manufacturing Co.* . . . and, of course, American Fabrics is subscribed to and helps to mould the thinking of executives in major textile organizations all over the country.

In addition, American Fabrics enjoys multiple circulation at the top buying and merchandising levels in the following mail order houses and resident buying units, including: *Sears, Roebuck, Montgomery Ward, J. C. Penney, Chicago Mail Order, Spiegel's, Mutual Buying, A.M.C., Weil and Schoenfeld, Natl. Department Stores, Belk Stores, Henry Rose Stores, Federal Dept. Stores.*

Besides being read and studied as a guide by textile departments in almost every leading university and college, American Fabrics is subscribed to by special categories of textile-minded organizations including: *United States Bureau of Labor, United States Department of Agriculture, United States State Department, Ice Follies Costume Department, Connecticut Mutual Life Insurance, California Apparel Designers, Hosiery Research Council of England, Silk and Rayon Users of England, United States Information Center of Helsinki, United States Embassy in Cairo, The Shah of Persia, Council of Industrial Design of London, Department of Industry & Development of Canada, United Artists, 20th Century Fox, Warner Brothers, National Coat and Suit Industrial Recovery Board, National Broadcasting Co., Columbia Broadcasting Co., Atlantic City Centennary Association, Thomas Cook and Sons.*

☛ *We call attention also to a special list of 750 foreign subscribers to American Fabrics. Many of these subscriptions are entered despite currency difficulties by directors of important foreign organizations.*

MANY PEOPLE have inquired why American Fabrics makes practically no effort to get more members. Because of the very nature of the book, we cannot produce more than our limited 17,000 copies of each number. We have felt that we can best serve those people who have a real need and use for American Fabrics. We have never attemped to "sell" or tempt prospective subscribers with special offers, etc. The past has borne out the fact that people who subscribe because *they want* to — not because *we want* them — are the best subscribers. We ourselves are stimulated, encouraged by the responsiveness and the high level of editing which our subscribers demand. And it is our belief that only an interested, responsive audience can serve to inspire a publication like American Fabrics.

American Fabrics is interested in and does continually seek new subscribers who can make use of the material and information presented in each number . . . and the form which is attached is for convenience in entering additional subscriptions. ☛

American Fabrics *. . . the basic textile publication for the nation's merchandising executives.*

FAR-REACHING INFLUENCE with manufacturers, retailers, merchandise executives . . . because every person who arrives at the point of responsibility for making decisions based on textile knowledge finds American Fabrics an indispensable source book. American Fabrics is recognized as the basic textile publication for key merchandise executives.

FAR-REACHING INFLUENCE with America's great textile authorities . . . because of its undisputed authority and its unique and dramatic tri-dimensional presentation, American Fabrics has been recognized by America's greatest textile authorities themselves as the most reliable authority to present new developments to the world. Organizations such as *E. I. Du Pont de Nemours, Inc., Eastman Kodak, Joseph R. Bancroft & Sons, Inc., Deering Milliken & Co., The Wool Bureau, Inc., American Enka Corp. . . . plus scores of converters, mills, and processors, etc.,* have used reprints of American Fabrics articles as educational tools for training schools, stores, consumers. Outstanding textile executives have repeatedly commented on the vital and brilliant way in which important textile developments have been reported and presented in the pages of American Fabrics, and in the wide-spread influence of these presentations.

* * *

Who Edits American Fabrics . . . Key figures on the editorial staff: Dr. George Linton . . . on technological developments in textiles; Cora Carlyle . . . on fashions and design; William C. Segal . . . on merchandising; Howard Ketcham . . . on color; Christopher Fremantle . . . on industrial developments; Estelle K. Silvay . . . articles of consumer and educational interest; Leonard A. Rothgerber, Jr. and J. A. Murdocke . . . on men's fashions. These key editors head up a highly trained editorial, art, and production staff, geared to bring you a brilliant presentation of all the important events in the textiles and allied fields.

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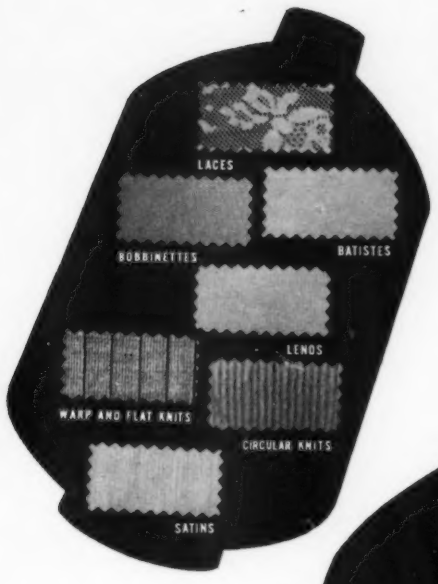

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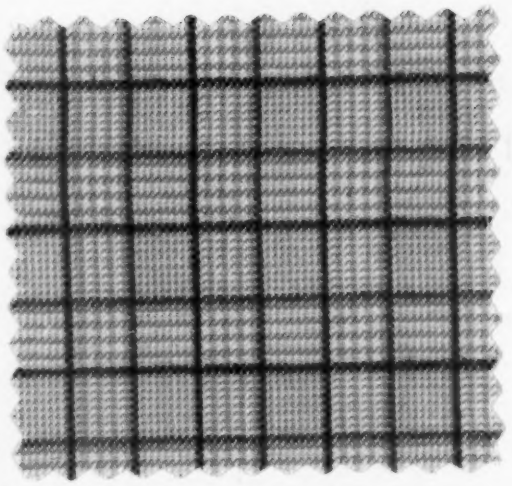

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See the Summer (May, June, July) issue of

GENTRY

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Tommies by Harry Berger

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If your present sheets and sleepwear are getting your goat—if they are not up to snuff — specify SPRINGMAID, deter aegiphobia, and rest assured.

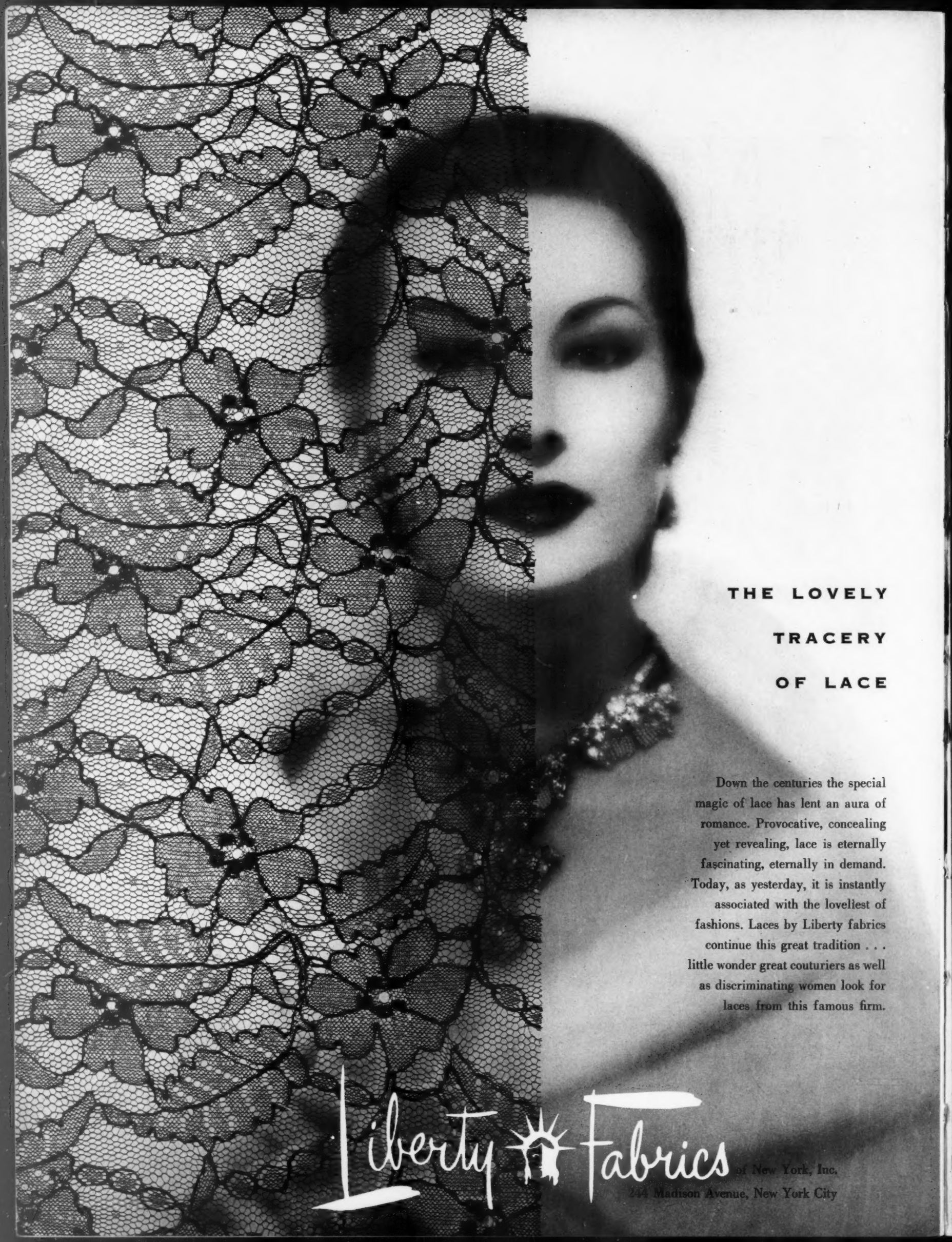
We put the "Broad" in Broadcloth—and now the "Filly" in Chlorophyll

Elliott White Springs is not a resort but an author. The confusion arises because SPRINGMAID sheets are known as America's Favorite Playground. You can get a copy of his latest book "Clothes Make the Man" by sending a label from a package of SPRINGMAID sheets or pillow cases and 10c for postage to Dept. AB-22, Lancaster, S. C. Send 50c for the new two-year SPRINGMAID calendar, beginning with the month of May, 1953, and featuring a bevy of beautiful girls.

*The Greeks had a word for it, according to Aristophanes.

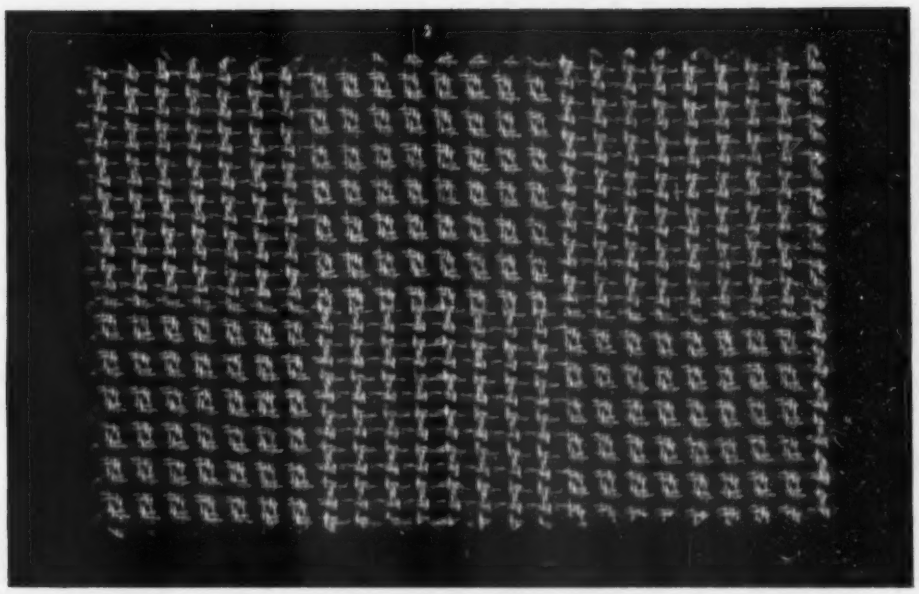
The Springs Cotton Mills

Lancaster, South Carolina



Down the centuries the special magic of lace has lent an aura of romance. Provocative, concealing yet revealing, lace is eternally fascinating, eternally in demand. Today, as yesterday, it is instantly associated with the loveliest of fashions. Laces by Liberty fabrics continue this great tradition . . . little wonder great couturiers as well as discriminating women look for laces from this famous firm.

Liberty Fabrics of New York, Inc.
244 Madison Avenue, New York City



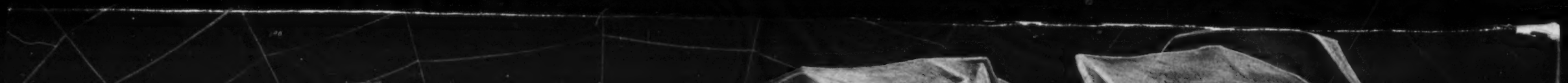
PEERLESS MEANS PEDIGREED

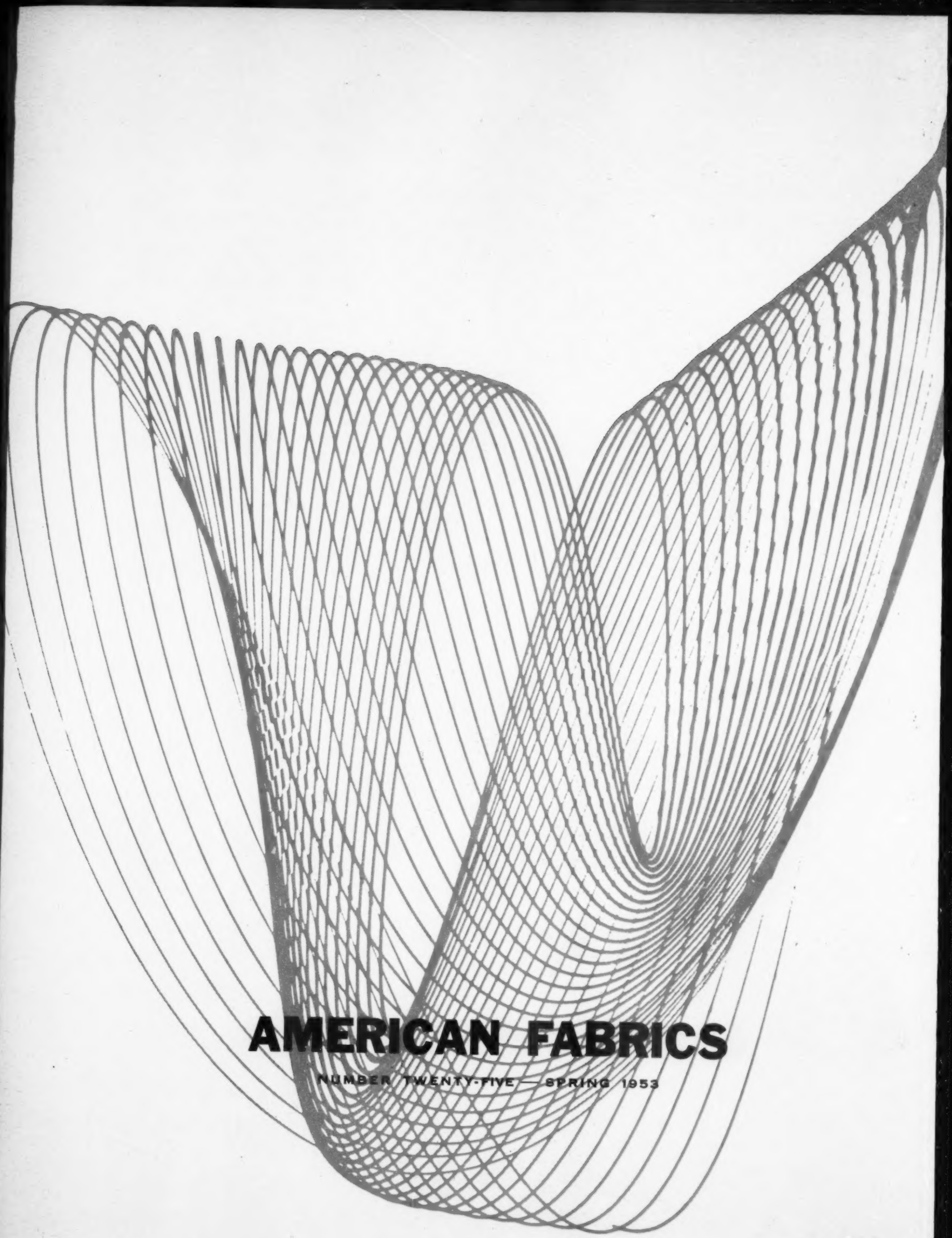
Peerless has a reputation for men's wear fabrics that are quality fabrics. From the traditional "all wool" to the Orlon and wool blends—every Peerless fabric shows definite signs of craftsmanship.*

**DuPont's trade-mark for its acrylic fiber*

Peerless Woolens

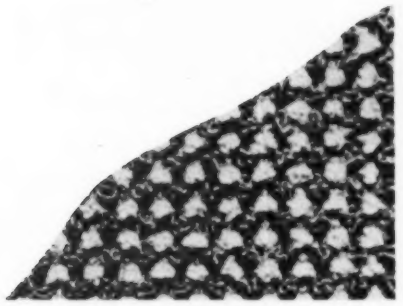
Peerless Woolen Mills
257 Fourth Avenue, New York
Mills at Rossville, Georgia





AMERICAN FABRICS

NUMBER TWENTY-FIVE — SPRING 1953



BLENDS IN NATURE

ACCORDING TO the sayings of popular wisdom, contrast is the spice of life; and it is no less true that the blending of contrasting qualities is one of the secrets of nature's infinite and never-ending appeal. When man rightly understands and imitates nature he reaches the highest expression of art — and this is true in painting and architecture, in literature and music, in foods, teas, and wines, and, equally, in fashions and fabrics in the fields of adornment and decoration.

In textiles it is as though a new sun had risen today. To the old horizons have been added wider perspectives and greater possibilities. In the combination and blending of new fibers . . . old with new, new with those yet to come . . . are possibili ties of textiles with appeal, variety, and functional quality hitherto never achieved in fabric history.

* * *

AMERICAN FABRICS was among the first to sense the importance and herald the coming of blends for the textile field. It is right and timely that we suggest facing certain facts about blends and combinations.

The textile industry has been quite right in taking advantage of the promotional possibilities of these new fibers, and the consumer in investigating many of them with curiosity as to their practical uses. But the time has come when blends and combinations have to be made and accepted on the basis of validity, and not because a particular fiber has struck the interest of the consumer, the manufacturer, or the mill.

Already certain facts are known; such, for instance, as that Orlon and cotton have a real affinity for each other. Today the combination of these two fibers can make, for a specific end-use, a fabric that has validity. And though in the case of many fabrics price is an essential factor, the future of synthetics and man-made fibers does not depend only on price.

* * *

For example, a particular tweed is made of nylon, Orlon and viscose rayon, and is comparable in price to all-wool; but the chief characteristics of this fabric are its washability, abrasion-resistance and high tensile strength. It is better than an unblended fabric for its individual end-use and the mill has been selling it on its merits and not in price competition.

Let us also forthrightly eschew a good deal of the nonsense about magical fibers. Is it necessary to dwell on fanciful qualities when a fabric's performance has an inherent validity of its own, especially when its components are combined and blended for a specific end-use? The consumer who is watching her dollars as never before can not be fooled too often, and is more aware than is realized of the fabric's performance.

* * *

Today blends are part of the whole textile landscape. They must be evaluated in terms of their validity for an end-use, their price and general appeal. Let us encourage our forward thinking resources to create more and better blends . . . Let us make sure that the power they have to evoke consumer response is backed by genuine purpose and value so that they may play their part in building the new era which they inaugurate.

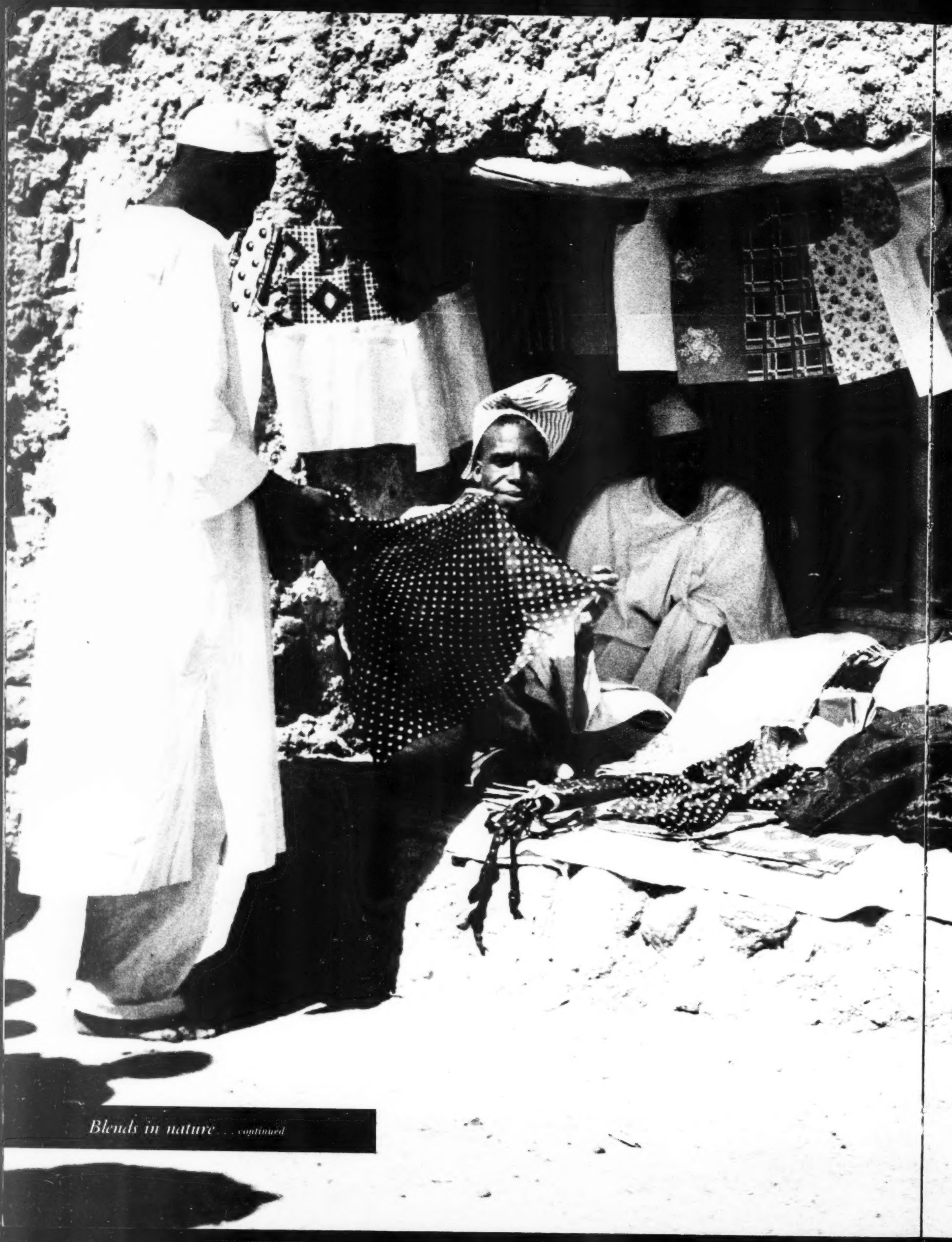
(please turn)

PHOTOS COURTESY B.O.A.C.

Blends in nature... continued

A wool and Orlon blend in a clear-finished lightweight worsted. The charcoal and white check pattern lends depth to the fabric. Designed for women's suits and dresses, this blend is crease-resistant, shape-retentive, washable.

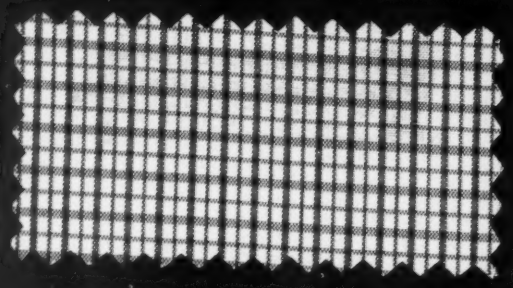
By J. P. STEVENS.



Blends in nature . . . continued

Gaily colored Lorette, an Orlon and wool blend for women's dresses and skirts, is engineered to make possible pleats that wash, in a fabric that does not fade, sag, or stretch in wear.

By DEERING MILLIKEN.



A silk and Orlon blend which because of its high pleat-retention and resistance to soiling has found favor in the fields of spectator sportswear and women's summer dresses. It has also found good acceptance for men's shirtings.

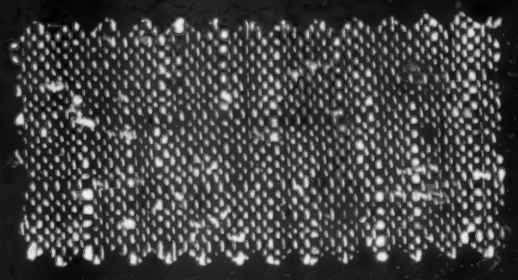
By SCHWARZENBACH HUBER.

Blends in natur

in nature . . . continued

An all-synthetic tweed suiting blended from nylon, Orlon and rayon in gay Donegal colorings. It combines strength and abrasion-resistance with washability and a high degree of shape-retention.

By MOORESVILLE MILLS.



Blends in nature . . . continued

A blend of muskrat fur, mohair, and wool gives a soft hand and surface interest to this coating. The interrupted bouclé stripe effect of white on black lends textured depth to the fabric's look.

BY ANGLO FABRICS

The Most Precious Fiber in the World

THE VICUNA is a small animal, weighing usually 75 to 100 pounds and standing less than three feet high, or about the size of an Irish setter, but with longer and slimmer legs. Its grace and speed amaze everyone who has ever seen the Vicuna in its natural habitat—Peru, Bolivia, Southern Ecuador, and parts of Argentina. It is the most elusively wild of all living animals, accounting for the extreme difficulty encountered in the search for the fabulous Vicuna.

Although classified as a member of the camel family, the Vicuna only faintly resembles any species of his ancestors. In his native land he is regarded as unique and as the Prince of all the Llamas. Once, only royalty knew the warmth and thrill of wearing Vicuna fabrics and they were held and guarded as safely as any crown jewel. Even today fibers from the Vicuna are the most expensive known anywhere. Efforts have been made to domesticate the animal, but as yet no one has been completely successful in this attempt, and the fibers from a domesticated Vicuna are not as fine in quality and in no way compare with the fibers from the wild Vicuna.

The animal ranges in color from a rich chestnut to paler shades with white underneath his outer coat. His chief individual characteristic is the long white hair which flows down along his flanks and falls beneath his forelegs.

It is the hair that grows closest to the skin that is the softest; the outer beard hair is not used. Average length of the fiber is about two inches, and it is more evenly distributed than other animal fibers. The fibers are generally stronger than wool of the same fineness, and in Vicuna, fineness does not influence the strength as it does in wool. Dyeing Vicuna is perhaps more difficult than any other fiber as the amount of dye pigment needed is greater in percentage than that needed for other fibers and penetration is longer for even dyeing results.

* * *

The most recent estimate of living Vicunas in Peru is approximately 50,000, and due to the animal's strange and elusive habits an accurate census is understandably impossible. The Peruvian government has increasingly made more stringent regulations in protecting Vicuna flocks. With strict enforcement of this legislation, flocks will have a chance to grow and the very small available poundage may gradually mount, coming continually closer to a more desirable supply.

VICUNA FACTS

The animal is found in the most inaccessible regions of the high plateaus in Peru at an altitude of 16,000 feet.

Vicuna fibers, which are strong and resilient, have a marked degree of elasticity and surface cohesion. They are the finest of all known animal fibers, with a diameter of 1/2500″ or about half that of the finest wool.

Vicuna may be used to the best advantage in its natural state. However, if the fiber is dyed, it is necessary to remove at least fifty per cent of the natural grease and oil because of the tendency of the fibers to resist absorption of dyes.

Forty Vicuna fleeces are required to make enough fabric for a single coat.

The sale of Vicuna is controlled by the Peruvian Government and only a very limited supply is available.

Genuine Vicuna overcoating has sold for as much as one hundred and fifty dollars a yard, and the finished topcoat for as much as one thousand dollars.

Before the Spanish conquest, hunting the Vicuna was regulated under the strictest supervision of the Incas or Indian rulers. Once every four or five years a hunt was organized by the Incas and was accompanied by great celebrations. Hunting by individuals was forbidden. Only the Inca himself, his family, and a few persons of high rank were permitted to use the skins or the wool. In this way the Vicuña was allowed to maintain its numbers.

The Vicuna can only be domesticated when born in the domesticated fold, or when captured very young. Domestication has only recently had any comparative success, the largest flock being owned by one Francisco Paredas, and amounting to more than 300 animals in 1943. He began shearing his animals in 1938, and obtained from each animal an average of 6/8 ozs. of fiber.

Although it is possible to bleach Vicuna, the hand of the fiber becomes somewhat impaired, and the bleacher will not accept responsibility for its condition after bleaching. Generally the fiber is manufactured in its natural state in order to maintain its unique qualities.

CORONATION IN THE NEWS

This year's Coronation ceremonies and festivities have provided, in addition to their glamour and excitement, an impetus for textile ideas and promotions both in Britain and America.

THE CORONATION YEAR in England has provided impetus both in Britain and this country for new enterprise in textile fields. Leading designers in the field of fashion, and such men as Oliver Messel, famous theatrical designer and décor artist, have worked in cooperation with the mills to produce new original designs with Coronation themes as inspiration.

Special fabrics, brocades, damasks, grosgrains, foulards and laces with Coronation motifs are being used by Worth, Norman Hartnell, Peter Russell and other leading English houses for the ball gowns and afternoon dresses now being ordered from leading London dressmakers.

The Robe of State will be lined with silk satin, which is being woven by hand at an old-established silk mill in East Anglia. The silk industry is producing a silk furnishing damask for the decoration of Westminster Abbey, cloth of gold for use in the Coronation ceremony, and crimson velvet for the robes of peers and peeresses. Colors have been chosen with an eye to their effect in a setting of cold grey stone walls, blue carpeting on the aisles, and the high brilliance of traditional uniforms, robes, and costumes. They will mingle effectively with a mass of shifting, gleaming color throughout the setting.

* * *

In the domestic market manufacturers have not been unaware of the special promotional possibilities suggested by the Coronation. Bates, for example, is presenting a Queen Elizabeth bedspread reminiscent of the time of prosperity and the renaissance of cultural achievement ushered in by the reign of Elizabeth I. It

Valerie Hobson, British film star, boarding a B.O.A.C. plane.

Below is a photograph of Bates' Queen Elizabeth bedspread.

forms a token, also, of the good wishes of the people of America for their friends in England.

This bedspread is conceived in a type of weave very popular in the late Sixteenth Century. The type of weave and certain classic motifs and detail work found on the spread are related to the elaborate silks, velvets, and brocades of the Elizabethan period. After much experimentation, Bates found it necessary to construct a special loom for this type of weaving and have applied for a patent for this new loom.

As a promotional gimmick directly relating the spread to the approaching Coronation in June, Bates offers as a unique gift to each purchaser of the spread an heirloom cast-brass doorknocker, magnificently sculptured in deep relief with the Royal Coat of Arms, and made in England.

BRIGANCE ON FASHIONS AND FABRICS

Brigance starts from the following questions:

1. **Is a design becoming?**
2. **Does it fit into any one of three moods — amusing . . . sophisticated . . . romantic?**
3. **Will it help to make women look pretty? (This last thought especially is uppermost when he designs clothes.)**

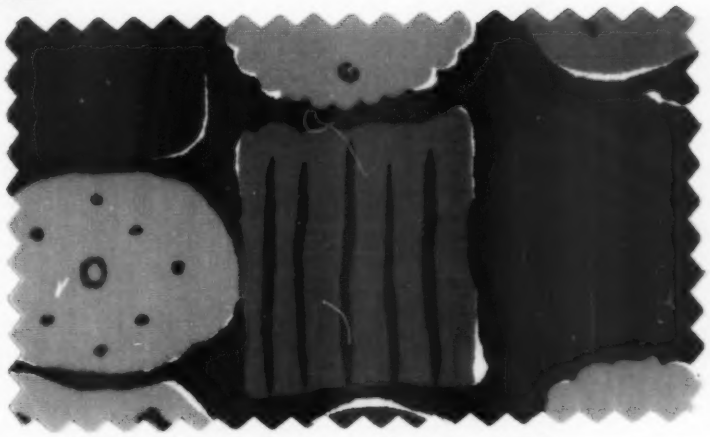
Brigance summarizes his approach to fashion as follows:

Design inspiration is where you find it (please note his "sea food" motifs with their delicious color shadings).

Poor design cannot be forced by promotional ballyhoo.

Prints should fit into an idea, and the idea must embrace the whole collection.

Inspirational material must be assimilated and tersely grouped; in other words, the design must be an organic unit.



A Springmaid cotton in gay cookie pattern. This screen-printed broadcloth was made for Brigance by SPRINGS MILLS.

A DESIGNER SPEAKS TO A MILL

TOM BRIGANCE, WELL KNOWN for his functional and stimulating casual clothes that American women love, has a message for the textile mills of America. Because his fashions start with the fabric and because he brings to his designs a fresh and highly individualized approach, his voice, added to others calling for greater cooperation between designer and textile mill, must be given a serious hearing. Why? Because it is the creativity of gifted designers first and foremost that endows the textile industry with vitality and freshness . . . two important factors that can keep the looms rolling.

How Brigance Works with Mills

Mr. Brigance likes to work with a mill in a specific way. He selects his material and designs a new collection of prints; then brings them to the mill for translation into the actual fabric. He has many of his designs pre-tested by screen printing in small lengths in collaboration with the mills. In this way, he can get exactly the results he wants, make experimental changes in color shadings, etc. Brigance is not content to order from an existing line, even when the patterns he chooses may be confined to his line . . . oftimes the so-called restricted designs are placed

(please turn)

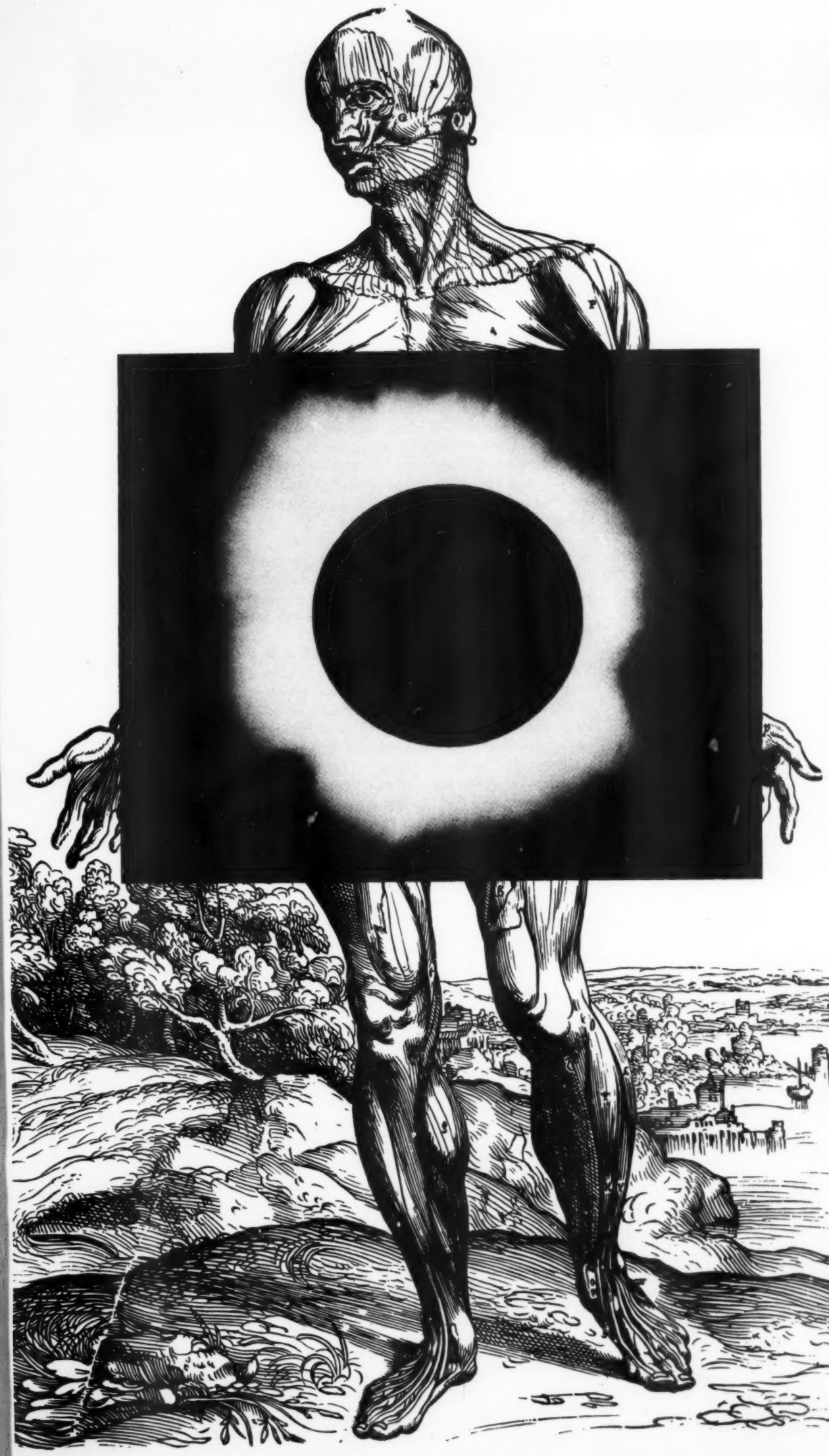
The fashions shown here and on the preceding page bear testimony to the premises postulated by Brigance. His fashions begin with the fabric and they are both functional and fun. They never fail in their purpose to serve the wearer and to enhance her. Buyers and stores report an ever widening audience acceptance of what they are coming to recognize as the sure Brigance touch. — C. C.

in dissimilar, non-competitive markets or they are moved to the bargain basements the next year. Both are fates that Tom Brigance wishes to avoid.

In the past, Brigance has succeeded in achieving unusual textural combinations, like workmen's denims with finest dotted Swiss fabrics . . . his present collection includes cottons with contrasting embroidered print effects and a separate group of silk with linen. In color we find all shades of pink, blue, or purple in flower-plaid print or shadings of lemon, orange and cookie brown.

A Plea for Cooperation

Although Brigance has found cooperation from the mills in the past three years, nevertheless he pleads that much greater encouragement be given the average designer and that it be accepted that more time is needed to achieve the perfection of line and color that makes for good design.



WANTED . . . MORE CREATIVE THINKING

No impartial observer can fail to be struck by the creative thinking which gave birth to the now famous Milium lining. To recognize that the heating plant, which nature has placed within the human organism, could be utilized to give birth to an entirely new fabric idea requires thinking on an unusual level. Once having conceived the idea of using the heating plant which operates within man, the problem of developing its potentialities presented itself. The solution of this problem (see below) was in itself a triumph of creative thinking. The reception which both the trade and consumers gave to Milium proved the soundness of the idea and its virtue.

More of this type of creative thinking — based on clear, original concepts, and making use of new techniques developed in other contexts — is needed in order to stimulate the body of the American textile industry. Let us, through open-mindedness, encourage the vital current of creative power which is inherent in the textile industry, to build to new heights on the broad base of service and sound economy.

MILIUM

WHAT YOU SHOULD KNOW ABOUT THIS IMPORTANT FABRIC DEVELOPMENT . . .

A coat of finely divided aluminum foil in the form of flakes is applied in a resin carrier as a spray to the fibers of the woven cloth that is being processed.

Applied in this way the metal retains the power of reflecting radiant heat like a mirror, yet does not hinder the circulation of air — all-important for body-comfort — through the fabric weave.

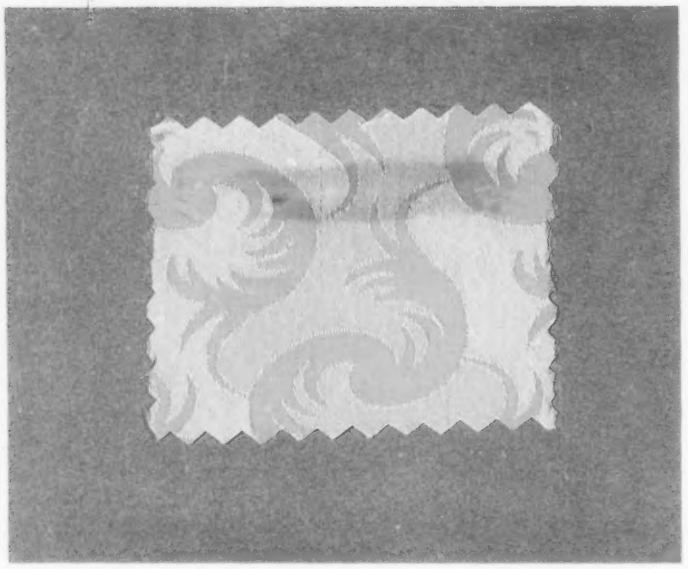
The metal-covered fibers thus act like a Venetian blind which catches and reflects the sun's heat while allowing free ventilation to pass through. The individual fibers and threads form heat-reflecting slats.

When the air is cold the body loses heat rapidly by radiation. By interposing a layer of metal between the warm body and the cold air, up to fifty percent more heat is retained in the body's central heating system.

For this reason Milium forms an important advance in the trend towards MORE WARMTH WITH LESS WEIGHT which is a characteristic of today's living.

RECENT DEVELOPMENTS IN NYLON FABRICS

For the first time a nylon jacquard crepe of superb quality is being produced.



Rekoyl-lon all-nylon crepe jacquard weave for a wide variety of apparel and decorative uses. By DORGIN TEXTILE CORPORATION

WITH THE POSSIBILITY of a return to the soft, draped line in fashion silhouettes, many mills have been experimenting with crepe constructions in the newest fibers. For example, interesting crepes have been woven in heavy denier rayon and in some of the synthetic blends. In this way vital new fabrics with both a crisp hand and draping quality have been achieved. These two qualities have aroused new interest in this traditional fabric.

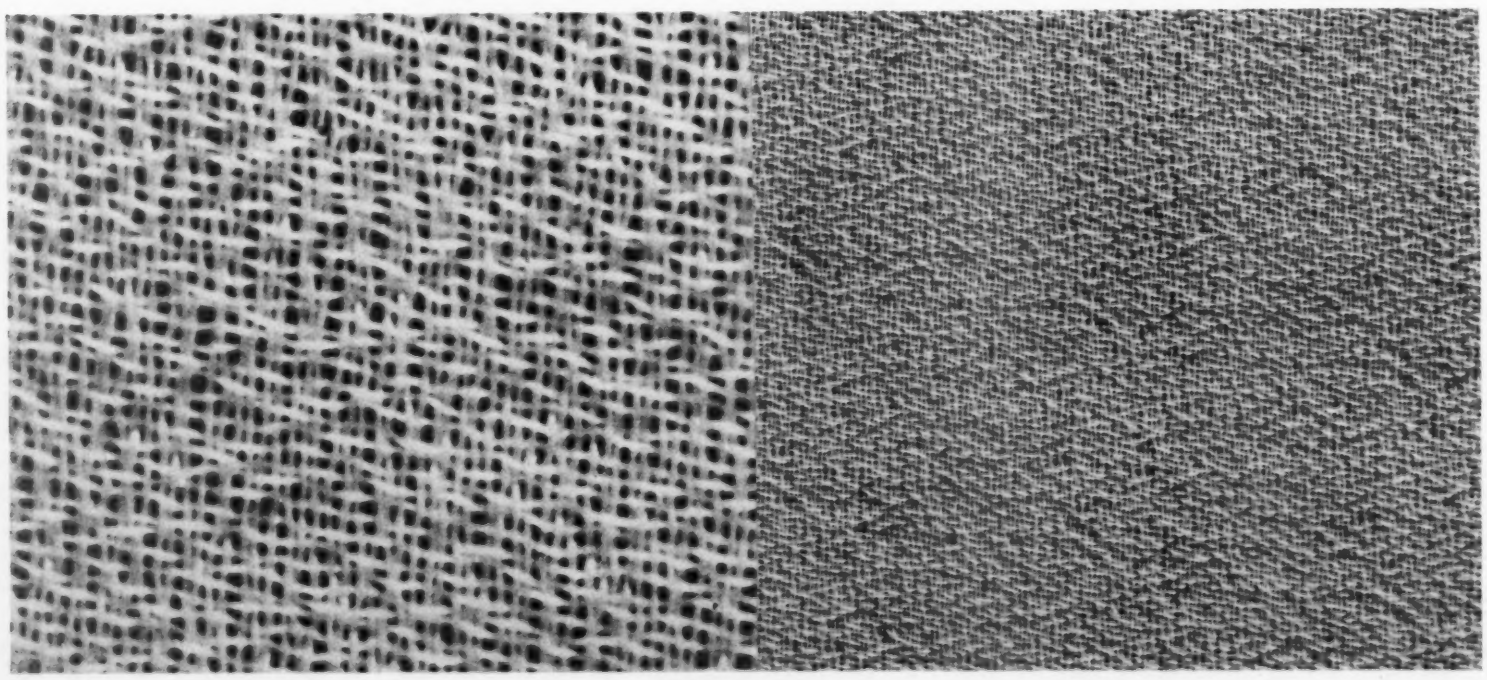
For a long time nylon was considered quite intractable in this respect. In 1949, however, a process was conceived by A. L. Dorgin for production of true nylon crepes and patented in 1951. This process consists basically in throwing nylon yarn with raw silk, the number of turns being determined by the size of final thread required. The desired type of fabric is then knitted or woven with the thread produced and afterwards shrunk by boiling off. The boiling off, in causing the silk to shrink, contracts or crinkles the nylon, imparting a creped surface effect to the fabric. Afterward the silk is discharged with chemicals harmless to nylon and the fabric is heat-set for permanence. By this means a perfect 100% nylon creped material is obtained, which can be dyed and finished in the conventional way.

This unusual approach has resulted in the possibility of manufacturing nylon hosiery, sheers, georgettes, and other crepe surface fabrics for various apparel end-uses which have received increasing market acceptance, and are creating a steady demand both here and in Europe, where licenses have been granted.

Satisfied with the results of tests and with full consumer approval in the market, the Dorgin Textile Corporation has recently begun the development of jacquards suitable for apparel, fur coat linings, and foundation garments. Such nylon crepes are seen to have, as a novelty for promotion and as a standard item for increased sales, almost unlimited possibilities in the apparel field.

These developments bring an entirely new face to an old fabric which has long been popular with the consumer. In using the new fabrics the consumer will find in classic guise new qualities of washability and durability in which fashion and fabric are happily united.

Below are shown enlarged photographs of nylon crepe woven from yarns made by the Dorgin patented process.



RECENT DEVELOPMENTS IN KNITTED TERRY FABRICS

A new family of knitted fabrics through the joint cooperation of buyer, knitter, and machine manufacturer.

EARLY IN 1952 a strong demand for cotton terry garments was evident at the consumer level. Buyers of knitted cloth, in turn, communicated this demand to the knitting mills. Mills trying to meet the demand were frustrated by low quality, difficulty of knitting, and lack of variation in design and color of conventional terry cloths.

The first major step in helping to place knitted terry in a competitive position alongside fine woven terry was conceived by Robert and Manuel Steinberg of Beacon Knitting Mills. Their idea was to combine the standard knitting elements of several different types of knitting machines to produce a conventional terry cloth with four-color automatic stripes. Patents were obtained and the principles relayed to Supreme Knitting Machine Co. for engineering development. Supreme's design department went to work with experimentation and standardization and finally produced the parts necessary to convert existing machines to the production of striped terry.

Development of Super-Loop Terry

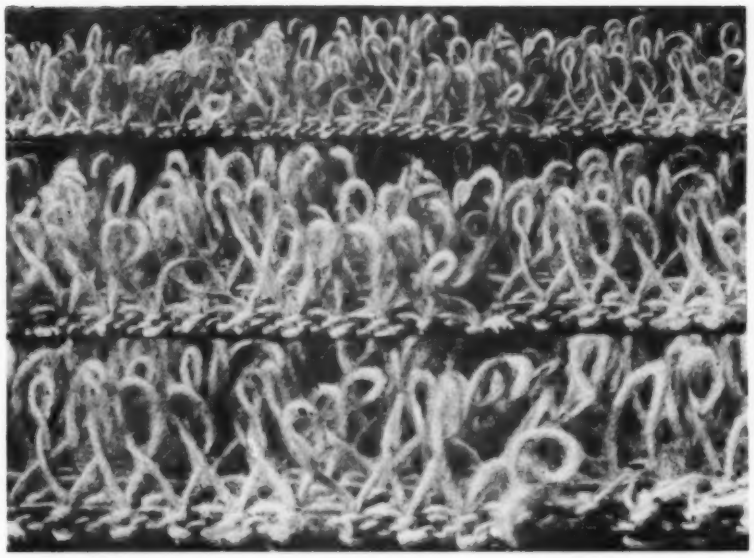
Thus far the terry fabrics produced had a limited use. The new striped terry was of a fine loop structure and was not adaptable for garments such as heavy bathrobes, beachrobes, and toweling. Supreme recognized that the potential market for a different type of terry cloth was still wide open. The engineering design section was assigned the problem of developing a cloth which was similar to, and could be made cheaper and faster than, woven terry. The goal was an extremely long-looped cloth with the loop length and density controllable through the entire range as in woven products.

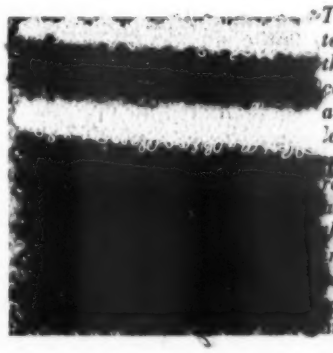
It should be noted that the conventional loop heretofore produced was almost impossible to knit longer than $\frac{1}{8}''$ in height. After many months of experimentation and development of various ideas, a system of knitting was discovered by Jack Radin of Supreme which produced a terry fabric meeting the original specifications. The system was then patented and machinery design was commenced. The final result was a simplified group of parts that could enable the conversion of standard machinery to produce the new fabric.

Control of Loop-Length and Density

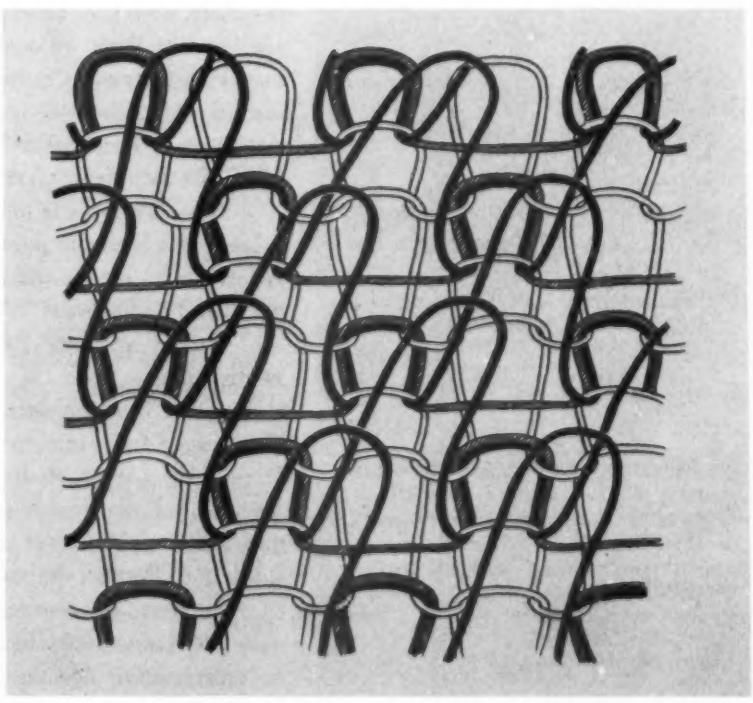
Machinery for the manufacture of Super-Loop terry was introduced to the trade at the knitting show in April of 1952. The new fabric had qualities of stitch stability, style, quality, and low cost. Loops could be made of any length up to $\frac{1}{2}''$ high. Cloth weight could be varied from as low as 8 ounces per yard up to 16 ounces per yard. Loop density could be controlled through a wide range to suit the use, and many different surface textures were possible. The unique stitch construction assured that each loop was tied firmly into the fabric for snag resistance and stability. Cloth uses range from very lightweight polo shirts to heavyweight bathrobes and toweling.

By combining the newly developed terry striping principle with this novel fabric construction, a colorful and useful staple terry fabric was introduced to the knitted outerwear trade. Advanced engineering methods assured that the new parts and principles could be adapted to existing machinery without rendering equipment obsolete. Today a single Supreme striper can knit a complete range of terry and jersey fabrics. Supreme's newest model knits striped *Super-Loop* terry, striped conventional-loop terry, striped jersey, Jacquard designs, as well as combinations of designs and stripes.





The mechanism for knitting the actual terry stitch is very simple and is based on the use of extremely high nosed sinkers in conjunction with needle pattern wheels and a unique camming arrangement. The extra-long loop is achieved, without danger of splitting or damage to the yarn, by selectively raising alternate needles to knit position and allowing the float, thus formed, to pass over the noses of two adjacent sinkers surrounding the welted needles. This method of forming a long loop enables the loop yarn to be knit into the cloth on alternate needles and anchor the loops into the cloth back.



Schematic drawing of normal terry "Super-Loop" structure showing the knit-in loops and tight backing-stitch construction.

A Tulip ... is a Tulip is a Tulip...

a Silhouette... a Riot of Color... a Profusion of Prints

Awesomely remembered as the genie who swept America's wardrobes into obsolescence, Dior's newest tour de force, the *Tulip,* was the talk of the Paris openings. While the ultimate significance of his new silhouette is still debated, the influence of the theme itself is significantly apparent in the fabric field. Already, Dior's inspiration has opened up dazzling vistas of color . . . color as rampant and rich, as manifold as the floral world itself.

The pros and cons of the silhouette notwithstanding, the Tulip is a refreshing new line emphasizing bulk at the top. From a slender, stem-like skirt, the line continues to a tiny waist and snug, shaped midriff to top width, via a curved bosom. The width spreads to the shoulders and is achieved by draped collars which hug the armtops in a deep decolleté, by off-shoulder effects, or tiny puffed sleeves. Interest is sustained on top by high pockets with flaps, by turn-over collars executed in petal-like details which a custom dressmaker can lovingly embellish for the individual figures. To the mass-minded American market, this silhouette presents obvious limitations. Top bulk can be seriously disproportionate to a standardized figure. But here, undoubtedly, is a stimulating point of view which the American market can temper and adapt to its will.

However, there is implicit in the Tulip a fluidity of line and new ways of manipulating fabric. This logically points to an era of smoother, softer fabrics . . . floating chiffons, crisp taffetas, silky crepes and dainty organdies . . . all of which were abundantly in evidence at the French collections.

But, by and large, the most dramatic concomitant of the Tulip is the *flower concept* in design and color. If nothing else, Dior has suggested a richly decorative source of styling and has stimulated an exuberant return to prints, which are the order of the day! They range from minute flower motifs to bold splashes of colors. The palette is exciting! It runs the gamut of delicate colors . . . pinks and mauves, cornflower and iris blues, luscious yellows, budding greens and deep rose reds. So exquisite is Dior's play of color that in its totality it has been likened to Renoir's paintings and has suggested to many the subtlety of Persian design.

By virtue of its creator's genius and the vividness of its symbolism, the Tulip may be only a conversational focal point in a trend towards flowering fashions. For fashion is a concentric affair and the Tulip is a conspicuous ripple. For the textile industry, it demonstrates the inspirational effects of a dramatic theme. This one provides a point of departure and a field day for fabric creativeness on all levels. LET US MAKE THE MOST OF IT.

ON THE GENUS TULIP. . . . *Said to be introduced into Europe in the year 1554 from Turkey. In Holland, in the 17th Century, there occurred such a wild speculation in tulip bulbs that it was known as tulipomania. Single bulbs sold for several thousand dollars each until the Dutch government interfered.*

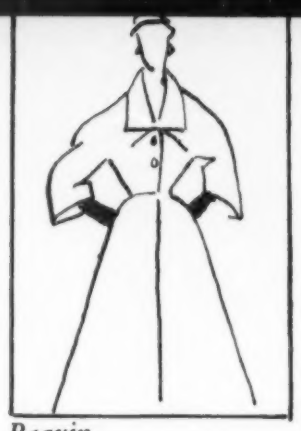
ON TULIP COLORS. . . . *The fabrics and colors that go into the Tulip silhouette should include old favorite terms used to describe the bulbs. Here are a few:*

Red and Scarlet: Rembrandt Red, Vermilion, Flame, Artus, Roi Cranoise.

White: Snowball White, Queen Victoria White, White Swan.

Pink and Rose: Rosa Mundi, Bride of Haarlem Pink, Rose Adeline.

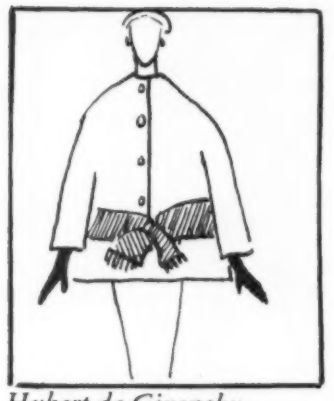
ON TULIPTIME PROMOTION FOR FASHION STORES: *Windows of tulips to go with the Tulip fashions in your store. Tulip prints as decoration. Scenes of Holland, etc., cut-out borders of tulip designs for windows, ads, and interiors. For over-the-counter promotion: Special section with a few tulip prints — pictures or photos — and, of course, real live tulips!*



Paquin

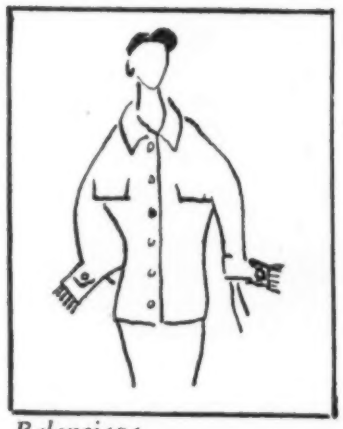
"L'Art et la Mode" of Paris Says.....

Keep Your Eye on the Following:



Hubert de Givenchy

1. THE SILHOUETTE FOR THE COMING SEASON *stresses a shoulder line which highlights the bosom. Waistlines are at their natural place, uncinched and unbelted. Hips, although gently curved, are not accented. Skirts, slim or with very moderate fullness, are one-half to one inch shorter. Sleeves, set in low, are short or three-quarter length.*



Balenciaga

2. COATS *are either straight and trim or fitted with soft waistlines that are usually slightly raised or plunging in the back.*

3. SUITS *are semi-tailored with box jackets or jackets that widen a little towards the bottom. Jacket necklines are varied — low and rounded, close to the throat, or with turnover collars away from the neck.*

Jeanne Lanvin

4. TOPCOATS, *short, three-quarter or seven-eighths length, are part of ensembles and are worn with skirts, dresses, or suits which may be made of the same material.*

5. DRESSES *have replaced two-piece models which are sometimes faintly suggested by a detail. The Princess line and coat-dress style are tops in dresses. Others have shirtwaist bodices with skirts that are either pleated or draped at the hips, also unbelted. Evening dresses are ankle- or full-length and are, for the most part, made of satin, silk chiffon, lace, piqué, silk organdie, or prints.*

6. FABRICS. *Woolens for coats are thick but lightweight. Tweeds woven in pastel tones; tennis flannels, some of them on white grounds; wool jerseys; soft crepes; alpacas woven with bright metallic threads; prints for all occasions, with diversified backgrounds; many types of cottons; rayons, acetates, and nylons in a host of new weaves.*

Christian Dior

7. COLORS *offer a wide range of beige, from café au lait to natural shades. Some grey, occasionally combined with beige. A little navy, brightened with white or combined with black. Much white, pure or pastel-tinted, and all the flower shades.*

MORE THAN SKIN DEEP

Taffeta woven of Celaperm acetate yarn for use in dresses, bathing suits, and other fashion apparel. A CELANESE fabric.

In the ever growing field of fiber manufacture it is noteworthy that many of the processes lend themselves to modifications which attain new and desirable qualities to be custom-engineered into the end-use in view.

SINCE FABRICS WERE FIRST MADE many thousands of years ago it is probable that the most highly valued quality among the purchasing public was permanence of beauty. For example, among the treasures of the Pharaohs in Egypt which have survived are fine linen sheets which today are still in a good state of preservation. Of course, the color has changed, but the fine threads still hold together.

Of all qualities the most fugitive is color, except in cases of gold thread; even silver tarnishes; dyestuffs have rarely survived unchanged. The reason is an interesting one. None of the fibers known to former periods of weaving were any color but white or natural, and even the most potent and permanent natural dyes did not possess an absolute inertness to all forms of chemical action. The dyes were attached to the outer molecules of the fiber and there was no penetration to more than skin depth and the dye molecules were therefore exposed directly to the air.

While modern dyes have a relatively high degree of permanence, they often have to stand up to chemical action and prolonged exposure to fumes in the air of cities. "Gas fading" did not play any part in the picture a hundred years ago. To meet the final requirements of permanence and beauty demanded by consumers today, new techniques have been developed.

Because the manufacture of acetate yarns and fibers involves the use of a simple solution of cellulose acetate in acetone, it is possible to admit various chemical ingredients which in this way are incorporated through and through the fiber. These can be colors in a variety of forms, and of the forms available a range can be selected which has both beauty and permanence.

Introducing the Color into Fibers

When suitably chosen pigments are introduced into the spinning solution for making acetate fiber, the resulting yarn coming off the spinning machine is colored uniformly through and through. Celanese Corporation of America has adopted the name *Celaperm* for its new yarns produced by this process. The pigments in solution or suspension are distributed all the way through the yarns and fibers and, therefore, produce fabrics with unusual brilliance of hue and spectacular color effects with a new level of colorfastness. The yarns and fibers resulting are a new and promising tool for the textile technologist and the fabric development expert.

The fabric development expert, by utilizing yarns with these sealed-in colors can incorporate various colors into one fabric without the necessity of a dyeing operation. One big advantage is that a yarn-dyed type of sample can be prepared and shown without the expense of first making batches of dyed yarns, with the knowledge that goods exactly corresponding to the chosen sample can be delivered.

In the event that a blend of acetate with rayon or other natural or man-made fiber yarn is desired, the fabric development man can, with one dyeing, obtain as many different colors as he has Celaperm yarns, plus the color of the dyed yarn. But in this case, the colorfastness of the conventionally dyed yarn is the controlling factor because the pigments used in Celaperm yarns are virtually permanent; that is, they offer maximum resistance to sunlight, sea water, commercial laundry formulae, gas fading, acids and alkalis, perspiration and cracking. Resistance to the foregoing agents is so high for practically all colors that the top ratings, recommended for use by the American Association of Textile Chemists and Colorists, are hardly high enough to rate adequately the performance of these colors.

Many of the Celaperm colors do not display any noticeable change when exposed up to 320 hours in the Fade-Ometer. The extreme fastness opens up new avenues of industrial applications, particularly where colorfastness to light, to atmospheric conditions, and to the leaching action of aqueous solutions is important. Celaperm yarns have the normally desirable properties of regular acetate, such as resistance to mildew and moths; excellent electrical properties; dimensional stability, and high resistance to deterioration and prolonged sunlight.

It is said that no man is a hero to his valet. Lack of a wide perspective is perhaps the reason why, when goods made of the new fibers and yarns are shown in the merchandise offerings of women's and children's wear and domestic furnishing fabrics, their remarkable quality is often scarcely realized. But it seems probable that in fact this is one of the most remarkable inventions of our times. As they pass into wider use, there can be no doubt that these new products will play an important part in the fashion and fabric picture and in merchandising throughout the industry • *END*

THE MAKING of MODERN TEXTILE DYES

THE MAKING of MODERN TEXTILE DYES

American Fabrics selects Ciba's newest Textile Dyes Plant, which will be formally opened in June 1953, to illustrate and bring you the story of modern textile dye making

THE TECHNICAL CAPACITY of the American dyestuffs industry is of the greatest importance to the American textile industry today, which is facing in its own field problems raised by the continuing development of man-made fibers.

Ever since the invention of magenta in the year 1859 by the chemist Verguin there has been a steady development and diversification of all types of manufactured dyes. There has also been a continual advance in their applicability and colorfastness which has contributed greatly to the growing stature of the industry, and to the service they are able to render to the consuming public.

Although it is a century since the synthetic dyestuffs industry was born, it has been confronted only recently with the need to reappraise the applicability of its basic dyestuffs.

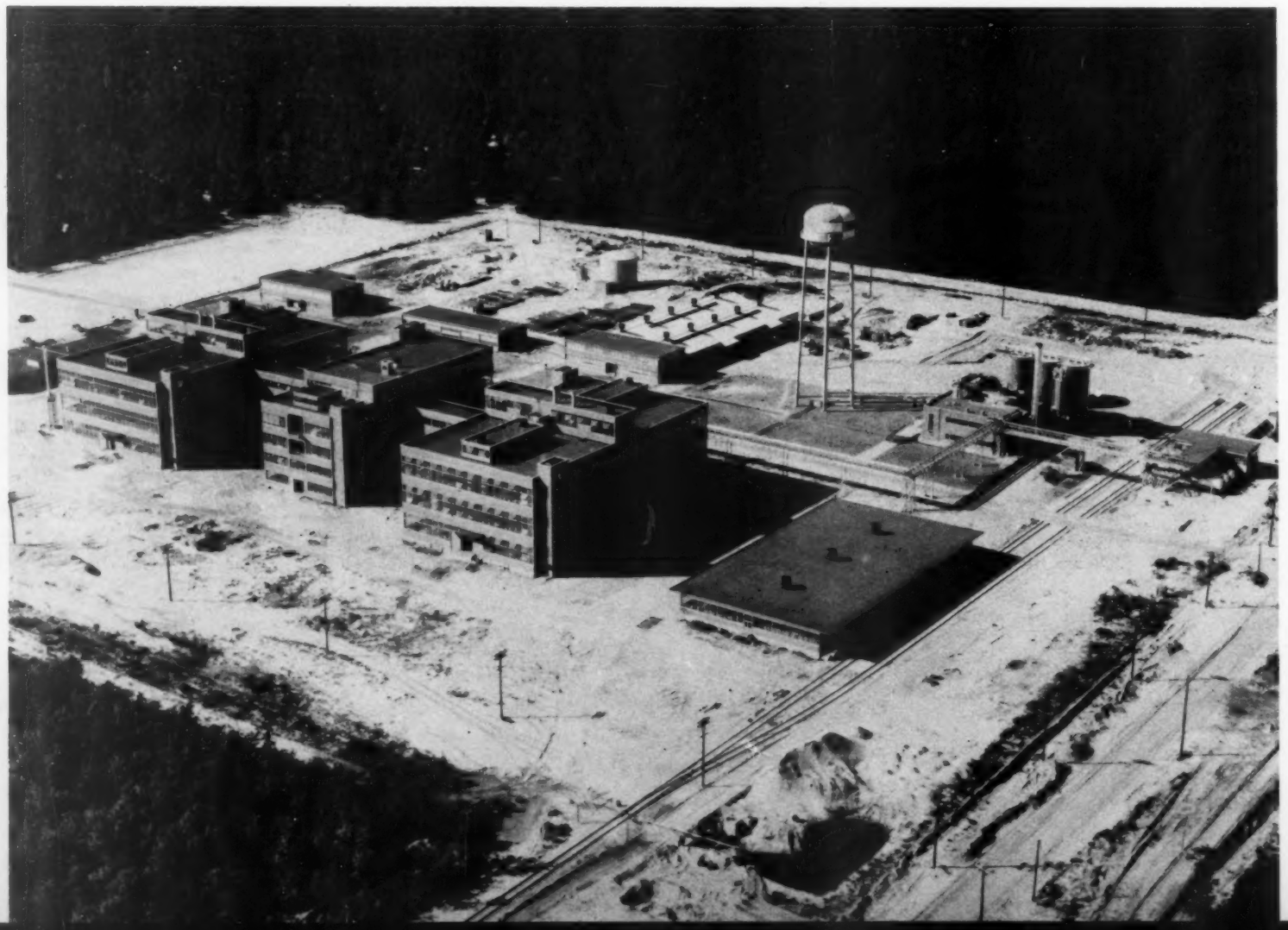
During the last two decades, however — that is, since the introduction of man-made fibers in the textile industry on a volume commercial scale — the necessity to provide for uniform performance in respect of shade, color intensity, light fastness, and launderability has been paramount.

In this situation the dyestuffs industry has endeavored to serve the textile industry by working hand in hand with, and in many cases anticipating the needs of, the dyers and converters. The work of the industry in going out to meet these new demands required long and meticulous periods of research, and it has only today begun to mature. Significant advances are continually being made in enlisting new dyestuffs materials and methods to augment those which have become traditional.

* * *

This is one reason why the Ciba Company, one of the oldest firms in the dyestuffs industry, which has to its credit many of the major advances in the accepted techniques of dyeing, has

The Toms River Plant stands in a location accessible to the principal markets and major distribution centers of the East.



recently projected, designed, and equipped the most modern and efficient unit for the manufacture of dyes and dyestuffs in the world at Toms River, New Jersey. Now entering production and representing an investment of around $17,000,000, the Toms River plant will be devoted exclusively to the manufacture of dyestuffs and to the service of the American textile industry.

How is a site for a major project of this kind chosen? First, accessibility to the principal markets and major distribution centers of the eastern seaboard is studied. Next, the availability of the chemical resources necessary in great quantity for such specialized manufacture. Also, the desirable social and community conditions which will form the environment of the plant's workers. Last but not least, availability of a first rate supply of pure water of up to two million gallons a day, to form the life stream of the flow of processes, without which the operation cannot proceed.

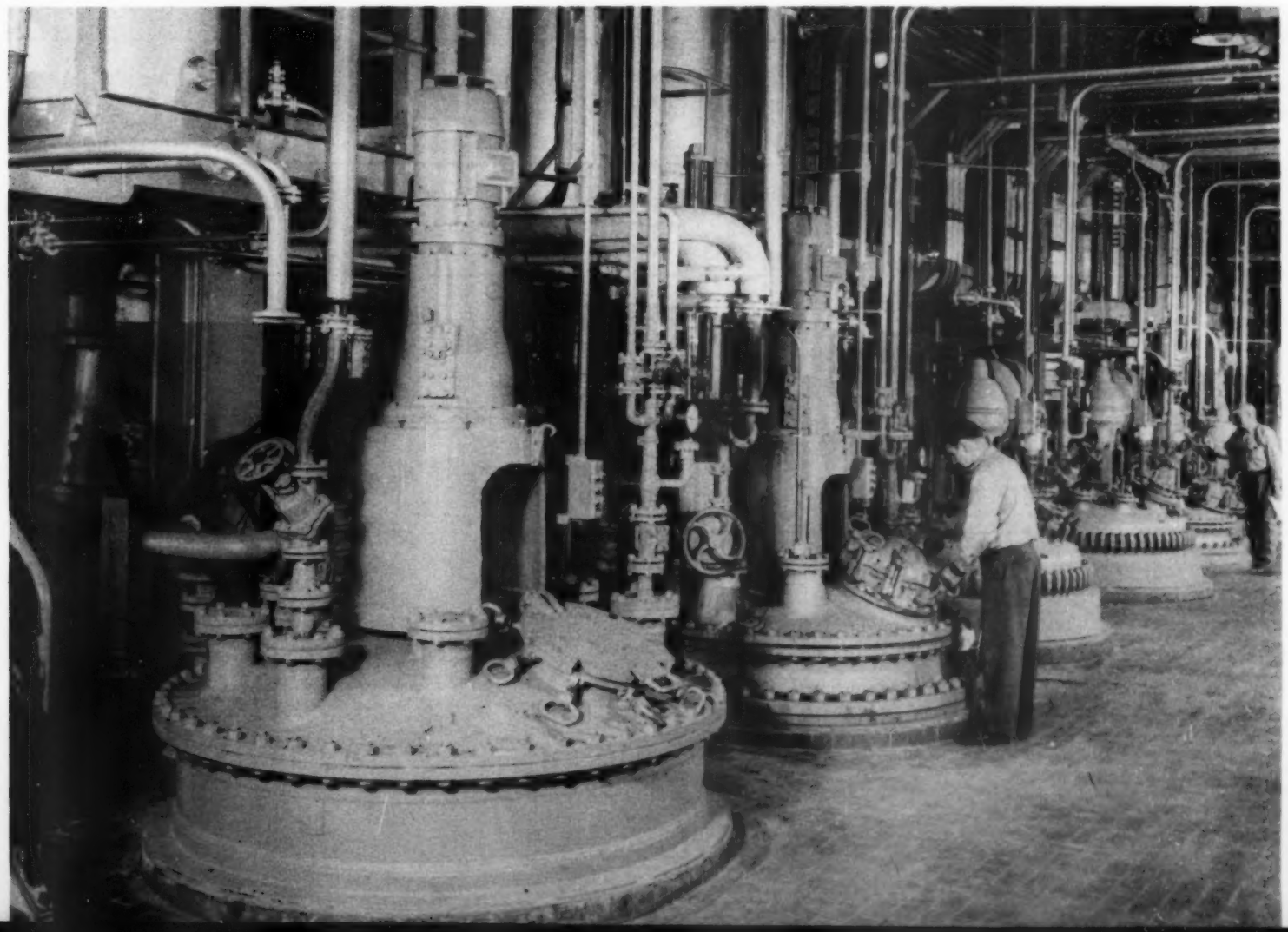
Most Modern Plant

The scale of the plant at Toms River demands an unusual degree of coordination in respect to storage, manufacture, and shipping operations, as well as research, control, administrative, and clerical services. For a production schedule of 4,000,000 pounds of anthraquinone vat dyes annually, the plant will utilize a total of not less than 20,000,000 pounds of chemicals. These will include basic requirements of sulphuric acid, caustic soda, muriatic acid, pthalic anhydride, ammonia, benzene, nitro-benzenel, glycerine, alcohol, and a host of other requirements.

The handling and processing of these chemicals require a vast array of special equipment, from the high precision microscopes used in the laboratories for control of production and for research, to a giant autoclave which weighs 36 tons and is the most

(continued on page 61)

In the control laboratory, seen at right above, the raw materials used in manufacture are qualitatively checked. Below are seen a row of gigantic kettles in which the dye ingredients are processed under heat and pressure.

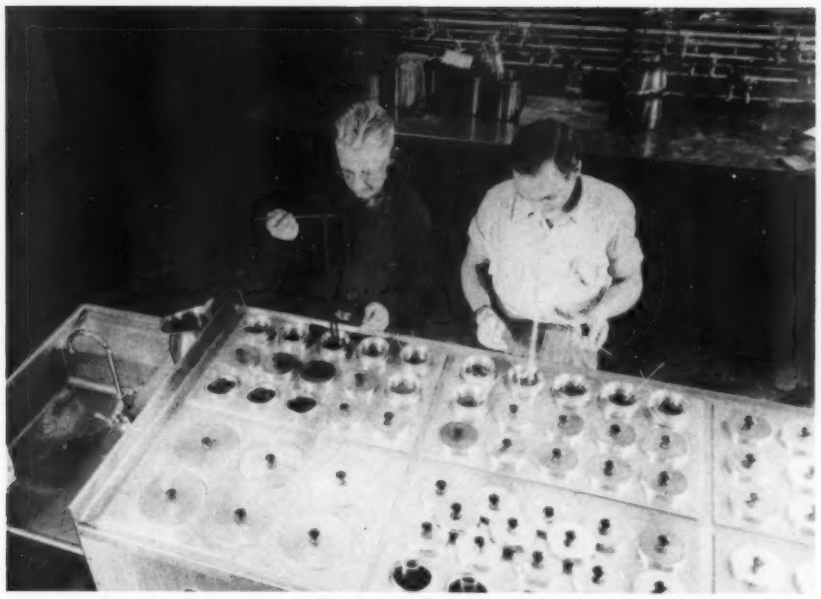


Flow Chart for Manufacture of

CIBANONE OLIVE 2R

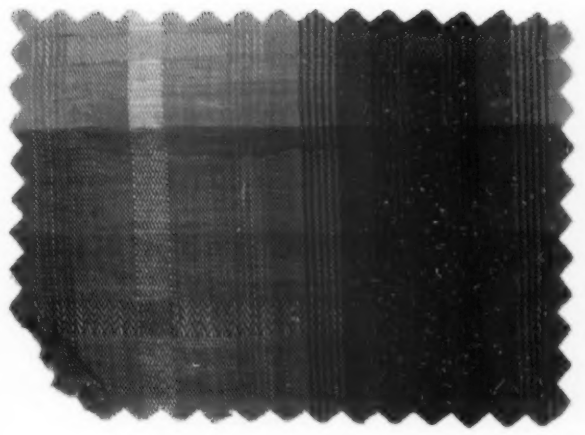
The flow chart below shows the manufacture of Cibanone Olive 2R from start to finish. 36 distinctly separate operations are involved, each operation requiring from 1 to 3 days. As Cibanone Olive 2R is only one of the many products made in the Toms River plant, it can be readily seen that 2 to 3 months may be required to turn out a finished dyestuff from starting materials.

STEP	MATERIALS	OPERATIONS	PRODUCTS
1	BENZENE PHTHALIC ANHYDRIDE ALUMINUM CHLORIDE	1 CONDENSATION 2 SOLVENT RECOVERY 3 PRECIPITATION 4 FILTRATION 5 PURIFICATION 6 DRYING	BENZOYL BENZOIC ACID
2	BENZOYL BENZOIC ACID OLEUM (FUMING SULFURIC ACID)	7 RING CLOSURE 8 PRECIPITATION 9 FILTRATION 10 DRYING	ANTHRAQUINONE
3	ANTHRAQUINONE OLEUM SODIUM CHLORIDE	11 SULFONATION 12 PRECIPITATION 13 FILTRATION	1 ANTHRAQUINONE SULFONIC ACID (SODIUM SALT)
4	1 ANTHRAQUINONE SULFONIC ACID AMMONIA	14 AMIDATION 15 AMMONIA RECOVERY 16 FILTRATION 17 DRYING	1 AMINO ANTHRAQUINONE
5	1 ANTHRAQUINONE SULFONIC ACID HYDROCHLORIC ACID SODIUM CHLORATE	18 CHLORINATION 19 FILTRATION 20 DRYING	1 CHLORO-ANTHRAQUINONE
6	1 AMINO ANTHRAQUINONE 1 CHLORO ANTHRAQUINONE SOLVENT	21 CONDENSATION 22 SOLVENT RECOVERY 23 DRYING	1.1' DIANTHRAQUINONYL ANTHRAMID
7	1.1' DIANTHRAQUINONYL-ANTHRIMID NITRIC ACID SULFURIC ACID SODIUM SULFIDE	24 NITRATION 25 FILTRATION 26 REDUCTION 27 FILTRATION 28 DRYING	4.4' DIAMIDO-DIANTHRAQUINONYL ANTHRAMID
8	4.4' DIAMIDO-DIANTHRAQUINONYL ANTHRIDIM BENZOYL CHLORIDE SOLVENT	29 BENZOYLATION 30 SOLVENT RECOVERY 31 DRYING	4.4' DIBENZOYLAMINO DIANTHRAQUINON ANTHRIMID
9	4.4' DIBENZOYLAMIN DIANTHRAQUINONYL ANTHRIMID SULFURIC ACID	32 CARBAZOLATION 33 PRECIPITATION 34 FILTRATION 35 PASTE GRINDING 36 PASTE MIXING AND STANDARDIZATION	CIBANONE OLIVE 2R



In the Control and Technical Services Laboratory quality is continuously controlled by checking samples of dyes in small vats.

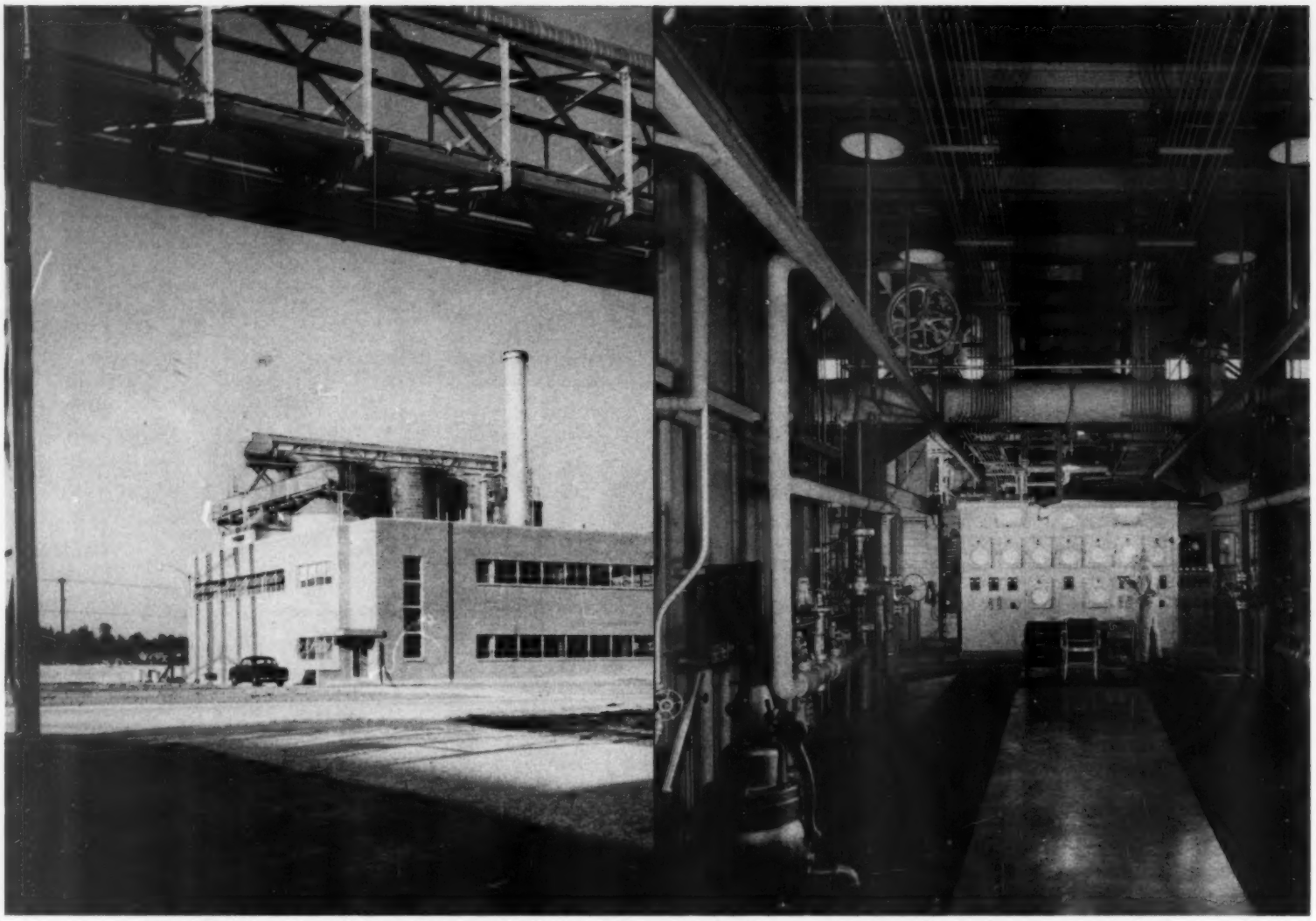
Vacuum filter boxes are lined with tile and have a porous stone filter bottom through which the liquid is removed from the cake.



Yarn-dyed cotton fabric dyed with CIBA light and wash-fast vat colors. By NEW BRAUNFELS TEXTILE MILLS

Vacuum chamber driers for drying dyes and intermediates. Wet filter cake is placed in stainless steel trays on heated shelves.

The fine processes used by manufacturers today are the outcome of generations of skilled hand dyeing techniques brought up to date.



The power house is of the latest design, and is fired by either coal or oil fuel at will. It is capable of furnishing one hundred thousand pounds of steam per hour at a pressure of 500 pounds per square inch. Exterior structure and control room.

A Chart of Dyes Used in Dyeing Some of

ACETATE	ACRILAN	COTTON	CUPRA	DACRON	DYNEL	GLASS	NYLON	ORLON
Regular acetate dyed with Acetate dyestuffs; some with Naphthols. Acid colors can be applied by special process using Acid or alcohol solutions. Vat can also be applied using alcohol solutions. Saponified generally dyed with cotton colors. Dye affinity increased by cold alkali treatment similar to mercerization.	Acid and Acetate colors	Direct, Vat, Indigo, Naphthol Sulphur Basic, and Pigment.	Similar to viscose rayon and cotton.	Acetate colors with a "carrier" at the boil. Acetate, Vat, Naphthol without a "carrier" by pressure dyeing. Vat and Acetate colors by Thermosol procedure.	Acetate, Acid, Direct, and Vat	Resin-bonded pigments. Special technique utilizing protein film applied during manufacture for Vat, Direct, Acid, and Chrome.	Acetate, Acid, Chrome, some Direct, Vat, and Naphthol.	Acid colors by the Cuprous Ion method. Acid, Basic, and Vat colors.

expensive single item of apparatus in the plant.

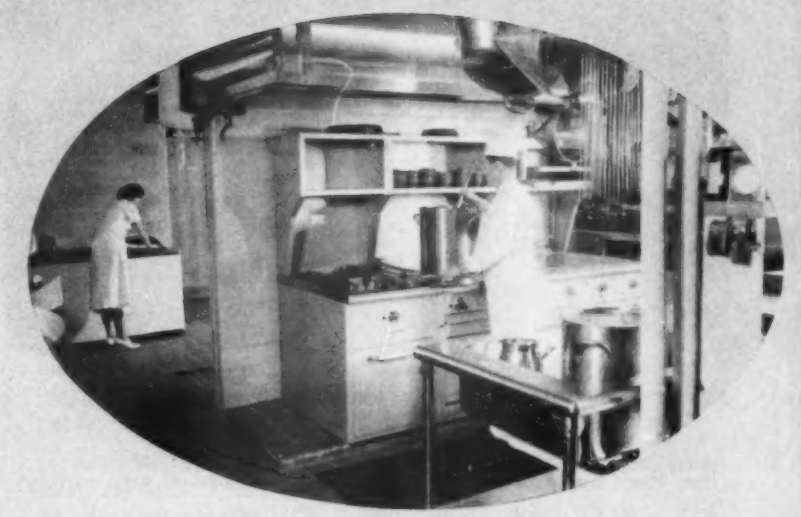
It also requires tank storage for chemicals — a *tank farm* — in the form of enormous steel cylinders containing the acids and other liquid chemicals used, a power plant capable of furnishing one hundred thousand pounds of steam per hour at a pressure of 500 pounds per square inch burning either coal or oil at will, and a plant for purifying the two million gallons of water used daily in manufacture so that it is returned to the river in actually purer condition than it is received from the wells of supply.

Anthraquinone Discovery

In order to appreciate the background knowledge upon which a giant industrial dye manufacturing enterprise of this order is based, and the experience necessary for its success, we may glance back at the history of the Ciba Company, a perspective covering well over half a century. Of this period the time which is of importance in relation to the Toms River plant begins in 1907 with the discovery of anthraquinone, a coal tar derivative which is extracted through several steps and has the form of a yellowish brown powder. The dye chemist can at will expand anthraquinone into a great number of related substances having the physical and chemical properties required for dyes. Many hundreds of shades can be made in this manner and their combinations cover a whole range of dyeing possibilities. Since 1907 the Ciba Company has been in the forefront of the producers of vat dyes derived from anthraquinone, and on the basis of this experience a production of thirty-five different colors is being scheduled, corresponding to the needs of the textile industry. Although only dyes of the anthraquinone family are scheduled for present production, the plant is capable of producing many other kinds of dyes manufactured elsewhere by the Ciba Company as need may arise.

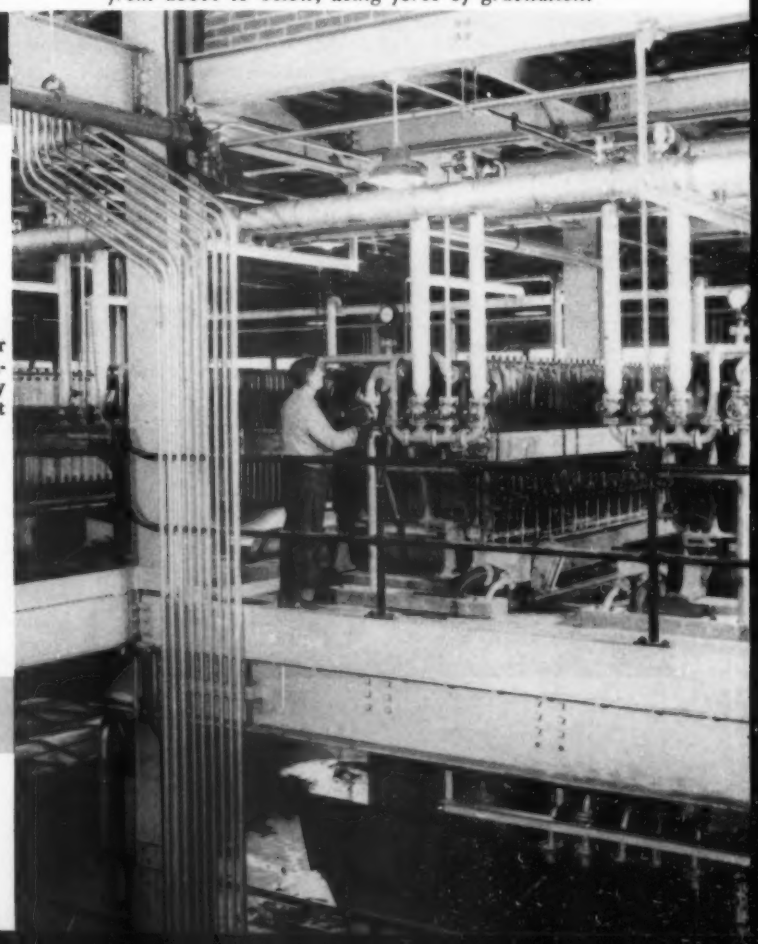
The production process of anthraquinone dyes calls for a series of thirty-six steps in six stages which are here shown in the form of a chart. The first step begins as the basic chemicals

(please turn)



Above is shown the staff cafeteria kitchen where efficiency and cleanliness are fostered by installation of the latest stainless steel equipment.

Below is a bank of filter presses showing how the process flow proceeds from above to below, using force of gravitation.



the Major Textile Fibers

	SARAN	WOOL	VICARA	VINYON	VISCOSE
	Can be dyed with Acetate colors. Mostly colored before extrusion.	Acid, Chrome, some Direct, Vat, Indigo.	Acid, Chrome, some Direct, Vat, Indigo.	Dyed with dispersed dyes with aid of certain swelling agents; solvent methods; pigment dyeing.	Same classes as cotton for regular viscose; medium- and high-tenacity are more difficult to dye.

From earliest times the use of fine textile dyes has gone hand in hand with the spread of culture and civilization.

flow from the tank farm storage reservoirs through pipe supply lines into the main manufacturing buildings.

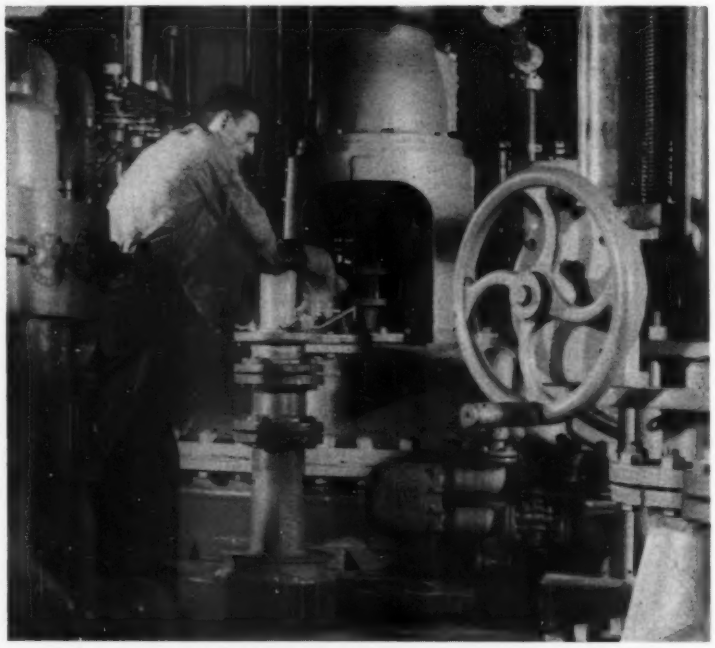
This group has been laid out in accordance with the needs of the flow of manufacture and designed on the most advanced principles of factory design. There are three main buildings of which the tallest is five stories in height, and stands between two three-story structures. Different processes are centered in each of the three buildings. Of the two three-story structures, one is designed for the processing of flammable materials; the other is destined for handling inflammables. The central building contains the equipment for final processing, including making the dye cakes into paste or drying, grinding and mixing them as powder. On the top floor of this building are located the control laboratories which provide a constant supervision over the quality of the products flowing from the plant to the textile industry.

The main processes in the smaller buildings begin on the second floor. Liquid chemicals flow from the tank farm into a storage tank and from there proceed into a measuring tank on the third floor. From there they pass down into one or another of the big kettles on the second floor.

Control and Uniformity

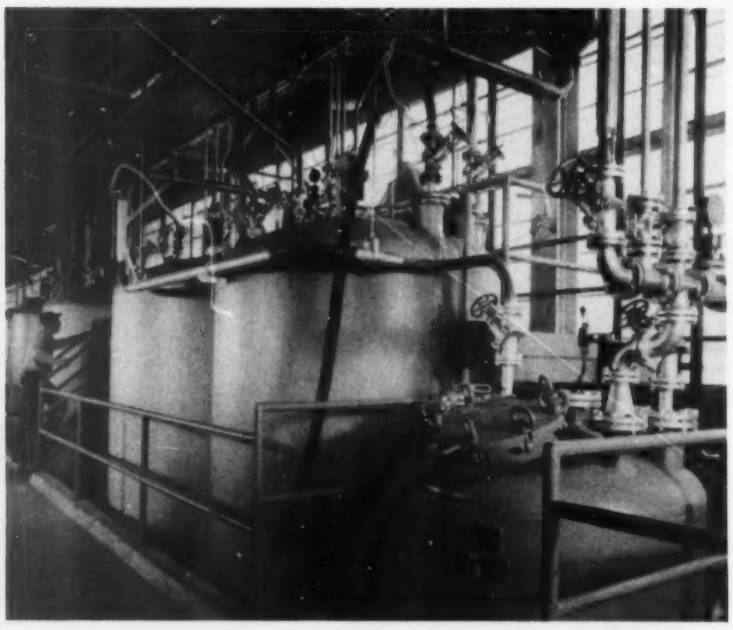
These kettles — there are about one hundred of them in the plant and they vary in size from 300 to 5000 gallons — are lined with materials not affected by the action of the various chemicals used. They are tightly sealed to withstand the high pressures and heat to which they are subjected and are equipped with an array of control devices which ensure that uniform quality is maintained at all times.

Where dry chemicals are used, the chemicals are assembled in proportioned quantities, from the bags, barrels, and drums in which they have been stored. They are then trucked to the kettle and emptied into it. Automatically stirred, they are heated and distilled in the tightly sealed kettle under steam pressure and heat. The finished liquid is then blown from the kettle through pipes to the floor above where it passes into a filter.



The Toms River plant contains approximately a hundred of these kettles with capacity of from 300 to 5000 gallons each.

Below is shown storage space for bulk chemicals which are used to the extent of some 10,000 tons annually by the plant.



The filter apparatus used in the two manufacturing buildings varies according to the particular process being employed. Three types are used: vacuum filters, pressure filters, and filter presses. No matter what types of filter are used or whether the original materials were liquid or solid, what comes out of a dyestuffs filter is a caky mass formed in the processing, readily handled.

The dye-cake is trucked across a connecting bridge from either of the manufacturing buildings to the fourth floor of the center building. According to its particular type and function, the dyestuff is then transformed into a paste or a powder. These pastes and powders, used with skill in the hands of the textile dyeing houses, will add beauty and color to millions of yards of fabrics . . . and will contribute in no small measure to the continued supremacy of American textiles in the domestic market and throughout the world. *END*

IMAGINATION AND FUNCTIONAL DESIGN
. . . combined in new mill office building

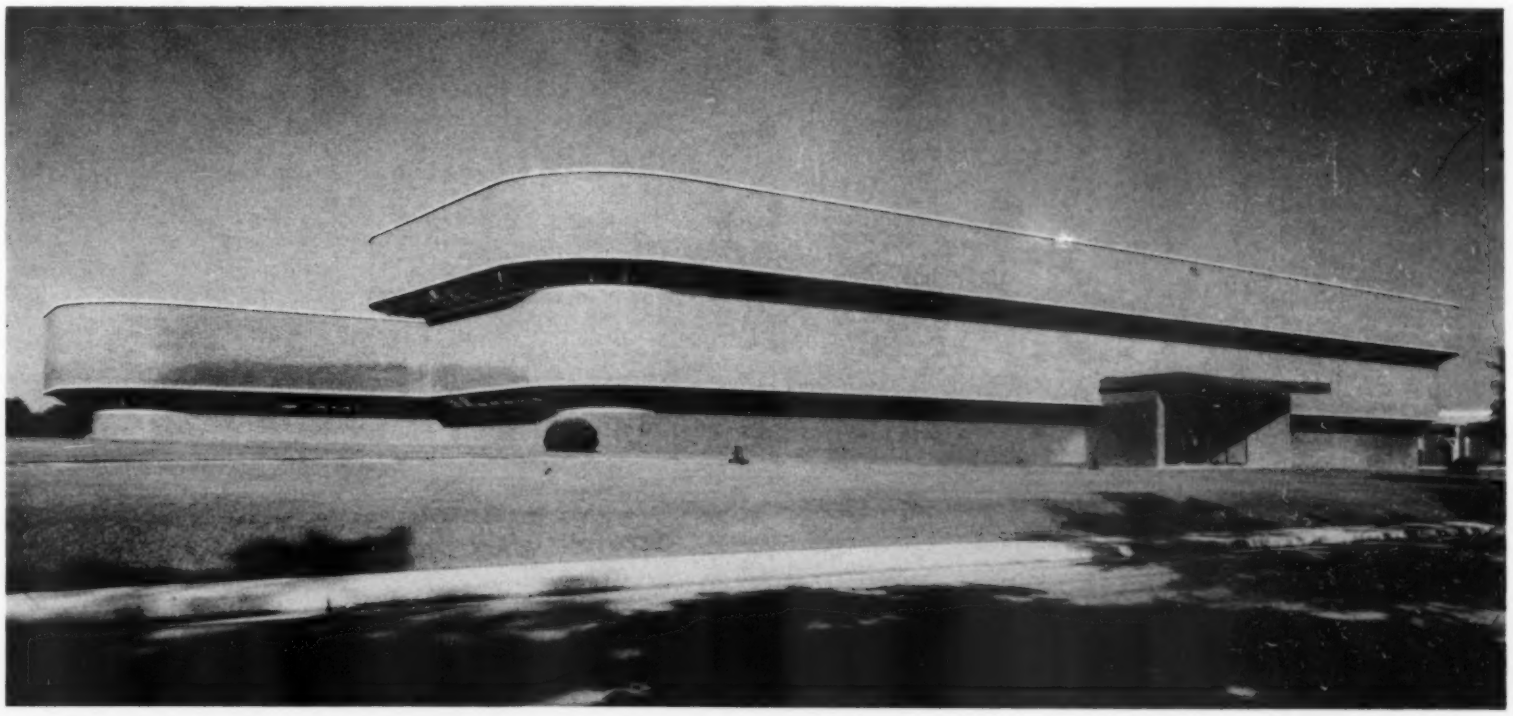
WHEN THE SPRINGS COTTON MILLS' new office building was opened for business at Fort Mill, South Carolina, on June 16th of last year, some fifteen thousand people came to gape at it. Not until ten days after it had opened was there room or opportunity for the transaction of any business, so insistent and numerous were the sightseers that swarmed in. This was no surprise, however, for the building had been under discussion since 1936, when President Elliott Springs made a trip to Europe and saw the I. G. building at Frankfurt, which had just been completed and was considered the most modern building in the world.

On his return, he had told his chief engineer that Springs was to have an office that would top the I. G. building, no matter how long it took. There must be doorless elevators, no end of fine woods, and a complete absence of infra-red light. However, before any progress could be made, the War intervened, and it was 1948 before the necessary materials were again obtainable without priority. The office was finally completed in 1951.

Built in two successively overhanging floors, the exterior walls, instead of supporting the roof, are suspended from it. This allows the windows to be set at an inverted angle of forty-five degrees, admitting light without glare. Refrigeration, evaporative cooling, and radiant heat are used to air-condition the entire building, which contains, in addition to the general offices, the President's office, and the Board Room, completely modern testing and research laboratories, plus a pilot mill where actual mill procedures and equipment have been faithfully duplicated. In these, continuous quality checks are maintained on currently produced goods, and on new processes and materials tested.

The actual building was completed before the engineers, architects, decorators, and furniture manufacturers had made any progress with the furnishings. The floors were teak, the windows had aluminum sash, the ceilings were soundproof panels, and the inside walls were movable partitions. It wasn't an easy problem because there was no precedent for furnishing twenty offices where the outside walls, the inside walls, the floors, and the ceilings had nothing in common with one another.

The President recalled that back in 1918, when he was a pilot with the Royal Flying Corps in France, he helped the British squadron furnish the mess with materials salvaged from crashed aeroplanes. He recalled table legs made of propeller blades, lamps of crankshafts, and sofas of undercarriages. He descended upon the junk pile and assembled an assortment of old cast iron,



The strikingly beautiful front facade of the new Springs Mills Office Building at Fort Mill, South Carolina.

steel, copper, brass, aluminum, wood, and fabric, which gradually was transformed into furniture.

The first sofa was made from an old Model O Draper loom. It weighed 1800 pounds and looked like a truncated Coney Island gondola. The second was made from a Hermas stitching machine, faintly resembling an early Colonial watering trough and weighing 1800 pounds. The third one was made of two aluminum motor supports and three loom lays, and turned out to be a practical and graceful piece of furniture.

At first, only creel boards from abandoned spinning frames were used for the wood, but, remembering the I. G. building, the president took the brakes off the cash register long enough to swap some scrap metal for some rare woods for use in making the tabletops, boxes, desks, chairs, and paneling, such as figured red gum, satinwood, burl redwood, burl walnut, lacewood, oriental wood, Brazilian rosewood, burl elm, English oak, Macassar ebony, figured teak, African walnut, harewood, butternut, crotch walnut, burl ash, prima vera, sapele, avodire, fiddleback maple, wild cherry, sebra wood, spruce, crotch mahogany, applewood, knotty pine, birch, violet wood, burl myrtle, pecan, dogwood, tulipwood, pecky cypress, albino walnut, and boxwood.

The walls were covered with burlap, which is used to bale cotton cloth, with figured paneling, and with wall boxes, maps, and charts. The walls are now practically invisible and the ceilings were painted to minimize their presence.

Before long possibly other industries may take their cue from The Springs Cotton Mills. The president of General Motors, for example, may soon receive you at a desk made of an old Cadillac landaulet top, while sitting in a revolving chair fashioned from an early Oldsmobile seat, and summoning the vice-presidents by the right note on an old Gabriel horn! • *END*

A desk with picker apron for column support, in which is incorporated a concealed wastebasket which swings out to open.

A display stand made from a Fales and Jenks spinning frame supports a scale model of the new building.

A bookcase made from an 1887 model Fales and Jenks spinning frame supported by creel boards strikes a decorative note.

Giving the final polish to a desk supported by bronze slasher rolls. The desk top is made from finely grained wood.

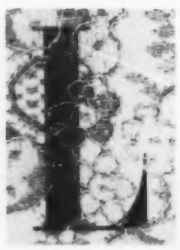
An executive table showing top of quartered satinwood with drawers at left covered in burlap. Note the original table lamp.

Windows in the new building are sloped outward in airship-gondola style.

Photo-panoramas surround the board room; in foreground is the president's desk.

In the vestry of the Church of St. Mary the Virgin in Nassau, the Baroness prepares to sign the register.

NO MORE LAVENDER FOR



LACE

The bride in lace.

IN ISSUE NUMBER 23 OF AMERICAN FABRICS, there appeared an article on the evolution of lace-making, from the earliest attempts at mechanization to the present streamlined production of the Leavers machines. The important conclusion drawn was that the $35,000,000 business engaged in by 76 mills has brought this fragile product — encrusted in a tradition of luxury — within the economic reach of masses. The barrier of price is down; designing ingenuity and the ferment of fashion have given the lace industry greater impetus; the advent of nylon fibers has produced a new dimension of durability; the imminence of other new fibers indicates even greater expansion and new horizons for lace.

This acceleration of growth and pace has, however, continued mainly within the prescribed boundaries of past lace usage . . . more extensively than heretofore but nevertheless recognizing conventional limits. For the burden of tradition has set heavily on the whole concept of lace application. Directional thinking was and is bound up with century-old association of lace and lavender. To rich and poor, lace is the symbol of sentimental and momentous occasions, categorized as the embellishment of wedding gown and trousseau, as the decorative accent of intimate apparel. In short, lace has been typed as the extreme expression of femininity without functional counterpart.

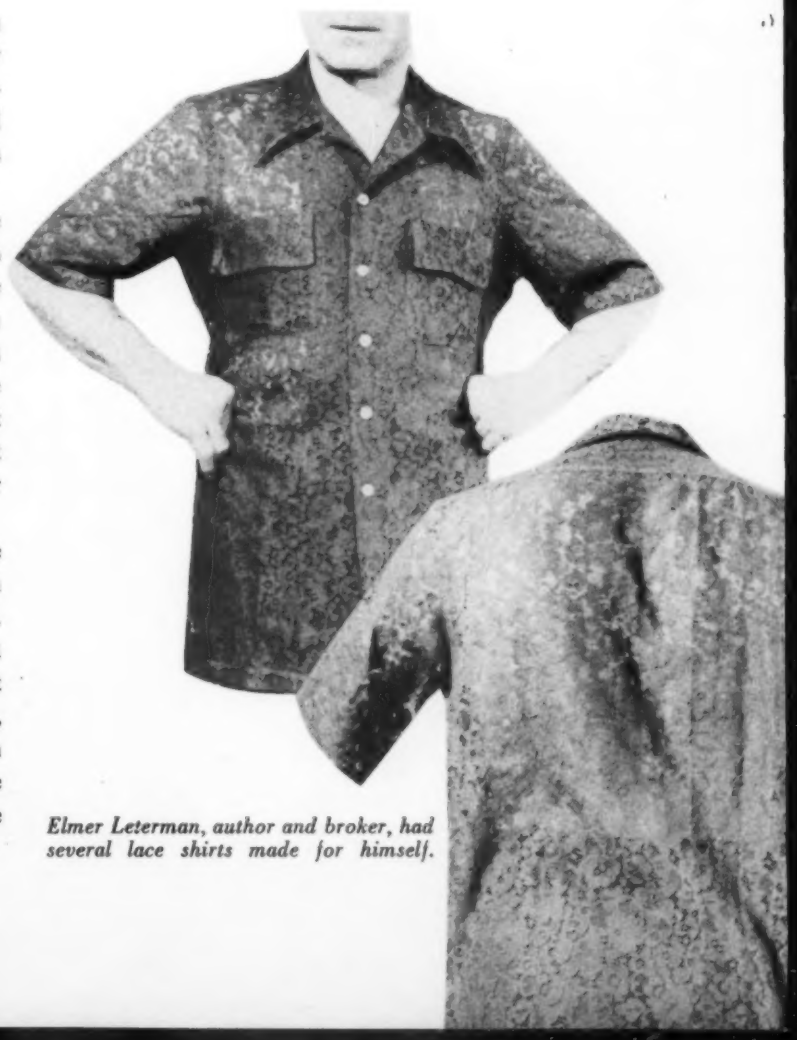
Assured of a time-honored and growing market within these traditionally defined boundaries, the lace industry can now reach into new fields of conquest. Starting in its own backyard, the lingerie field, we see a break with the conventional treatments of the past. As we surveyed the field (issue No. 24) with pointed questions to its leading designers, these facts emerged: Nylon laces have removed previous limitations and

The wedding party at the reception held for Baron and Baroness Ernst Lyssard von Hoynigen Huene (the former Nancy Oakes).

stimulated lavish, imaginative treatments of lace as fabric rather than trimming; new techniques in the use of lace, to synchronize with new silhouettes, were in evidence; lace in large areas was deemed a contribution to coolness and comfort. While emphasizing the fashion appeal and decorative aspects of lace, designers invariably commented on its functional qualities and the freedom from limitations.

Using these fresh concepts as a point of departure, we can foresee an extension of lace into as yet unexplored areas of apparel . . . into the so-called everyday classifications. In justification of what might be considered heretical thinking, we point to the refinement of such an earthy fabric as denim to extremes of high fashion. In an age which has imaginatively translated the most prosaic of fabrics into versatile fashion, the converse is possible and probable. While lace is the most intricate and delicate of fabrics in design, it is no longer the most vulnerable in wear. All that is required is a bold stroke of designer imagination to release it in a multiplicity of new end-uses.

It is not stretching too many points to conclude that such events are in the making when we recall the revolutionary and effective application of lace to bathing suits by Carolyn Schnurer about four years ago. Here was a significant departure which will bear watching. If such a functional and classic garment takes to lace, it is logical to assume that it has a place in the overall scheme of daytime apparel . . . beachwear, casual wear, accessories, even men's sports shirts. To us who function as the link between fabric and fashion it will be interesting to explore and report. How will creative designers, stylists, coordinators use lace in the near future?



Elmer Leterman, author and broker, had several lace shirts made for himself.

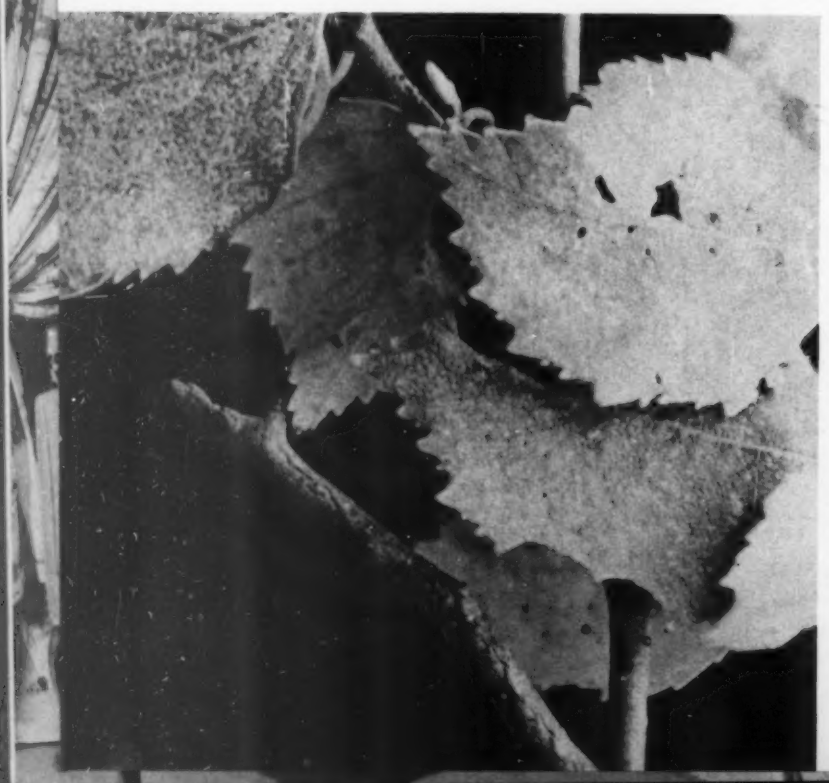
Above at left, a *Man's Dressing Room* designed by H. W. Grieve of California features leather in unusual uses . . . *Trianon,* at right, was designed by L. Raymond Toucher of New York in a style recalling the Empire period. Below: *La Petite Salle* at left is the work of Mildred English Deutsch of San Antonio, Texas and betrays feminine appeal in use of leathers . . . at right, *Chambre pour Deux Jeunes Filles* by Mabel Schamberg of Chicago gives the same in modern vein.

Corners in Leather

Leather gives elegance and masculinity to a *Bachelor's Flat,* above at left, designed by Rachel Wade of Pittsburgh . . . at right William Pahlmann's *Fanfare* obtains distinction and expresses refinement by the discreet use of contrasting textural values. Below, at left, Melanie Kahane of New York suggests informality and luxury for a corner of the living room with her *Morocco Bound* . . . at right, *Homeward Bound* shows decorative handling by Virginia Conner Dick.

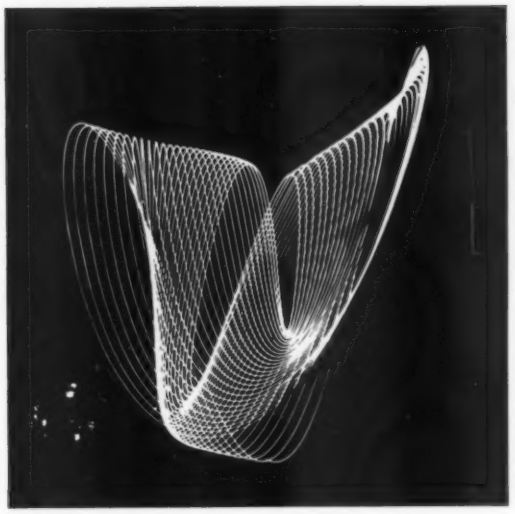
FROM NATURE'S COPYBOOK

Above: The stick insect ***Ennomos alinaria,*** resting on a twig of the tulip tree, blends with its surroundings. *Below:* Even a keen-eyed bird will not detect the functional twig-form used as decorative cover by its prey.



WHERE does nature find the vast array of motifs with which she continually decorates every phase of animal and plant life? She often steals from herself and gives from one hand to enrich the other.

In doing this she illustrates an abiding principle of industry and art — that forms developed for one purpose often serve to enrich another and find their ultimate application in different spheres. What today serves a decorative purpose will tomorrow be used for an industrial one, and the forms of industry yesterday become the decorative motifs of today.



AMERICAN FABRICS

inaugurates a special section

American Industrial Materials

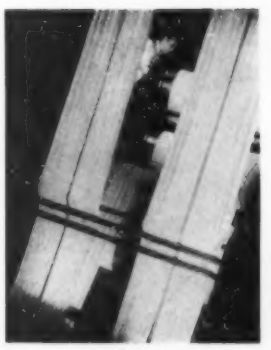
for the presentation of facts and

the dissemination of ideas about the fabrics

of American Industry, Agriculture, and Defense . . .

with special emphasis on the development of

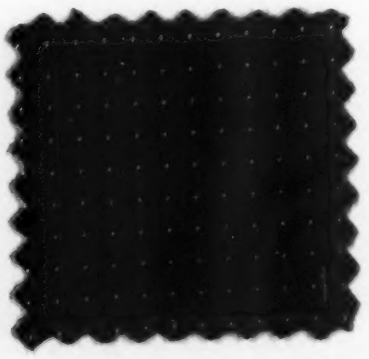
new fabrics and new finishes for new uses.



High style in auto upholstery

There's a definite modern *chic* to cars upholstered in Candalon Nylon. And the smartness is more than skin-deep—for Candalon is hard to soil and simple to clean. Its texture doesn't mat with clothing to prevent your moving easily—but it *does* prevent sliding on short stops. It keeps new-looking right through trade-in time. Don't fail to get Candalon's many advantages in your new car—the leading makes have it. And by the way: there are other fine Candalon fabrics for furniture, too!

Candalon
Upholstery



Collins & Aikman
America's Largest Weavers of Fine Upholstery Fabrics

Editorial Credo

The business of making and marketing fabrics for industrial purposes presents the strange picture of an industry without a spokesman . . . without a publication devoted to its needs and interests.

The field of industrial fabrics is one of the least studied and least written up of any on record. There is only one book on the subject; an excellent one, to be sure, but written with a limited purpose. There is literally no bibliography on the subject. A whole morning's search in the library of the Harvard Business School revealed a few desultory references to footwear fabrics, automotive fabrics, and one or two others, but not a single treatment of industrial fabrics as a whole. For printed matter on the subject, one must go to the scrapbooks of advertisements and trade literature published by companies engaged in manufacturing or processing fibers and fabrics for industry.

Instead of being the most sparsely covered, industrial fabrics should by all rights enjoy the benefits of far more careful study and editorial comment than most segments of American industry. The facts of the case are that the user of industrial fabrics needs more information, more detailed and better documented than, let us say, the garment manufacturer who spends a large part of his time in textile markets and is frequently somewhat of a fabric expert himself.

An historical flashback over the last 50 years focuses a revealing light over the current status of industrial textiles. As the American population grew, especially since the turn of the century, American mills expanded to meet the growing needs of the people for clothing and household purposes. These needs have been more than adequately met since the country virtually achieved textile independence from foreign sources in World War I.

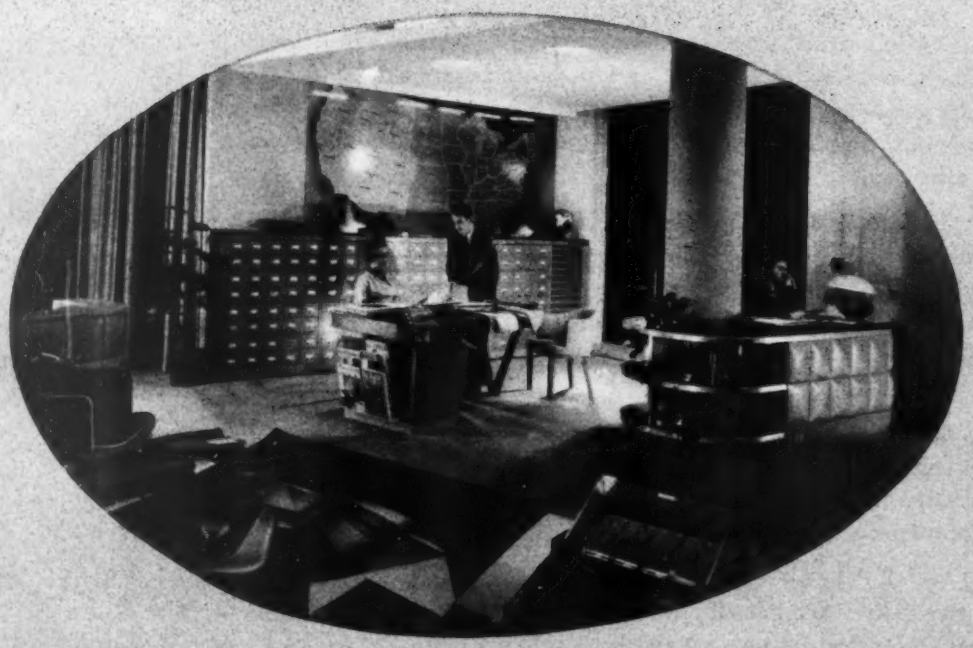
Until very recently, however, the vast and basically important requirements of industry have not been understood, let alone anticipated, by the fabric interests of the United States. The technological progress that has been the wonder of the world has opened up tremendous fields for fabrics. Each new invention and new machine, each new product and new material, many of them stimulated by research for defense industry, mean an opportunity and a challenge for a new fiber, fabric, or finish.

While the mills may have been slow in gearing themselves for the production of industrial materials, giant strides have been made in the last few years. It is, therefore, of utmost importance for the modern purchasing agents of large corporations and the officials of government procurement agencies to be thoroughly posted on the new uses, new fibers, new finishes, and new constructions that are descending upon the market month after month.

But the user requires more than that. The subject of industrial fabrics is getting so big, so complicated, so technical, that there is an urgent need to explain and elucidate, to separate the wheat from the chaff, to discard the unimportant, and highlight the items of real significance. There is need for competent evaluation, for rationalization. And, above all, there is need for a *showcase*, so that the new fibers and fabrics and finishes for industry can be exemplified by actual swatches, for all to see . . . to handle . . . to analyze.

The makers and users of industrial fabrics also require a medium for the interchange of ideas and for the presentation of each other's points of view. All this it is our purpose to accomplish; and it is the further purpose of this publication to point to new uses and new opportunities for industrial fabrics, to new procedures and improvements — to encourage any and all effort that will result in better fabrics for better products . . . for better living.

In other words, the program is to give textiles for industry the same imaginative and inspirational treatment that AMERICAN FABRICS has established for apparel and household textiles.



PANORAMA *of the General Motors Styling Section, where the shapes of cars to come are determined. Here imagination wrestles with the future. Here the obstacles and limitations of today are swept aside in the thinking of and for tomorrow. No body design, no interior arrangement, no color scheme, no textile application is too advanced for the inspirational thinking and development work of this group of devoted pioneers.*

* * *

On this page you see the library of color chips in the General Motors Styling Section Interior and Color Studio from which choices for exterior colors of General Motors cars are selected. Here, stylists match up seat and interior trim fabrics, steering wheel ornaments, body hardware and floor covering into a single harmonious whole.

GENERAL MOTORS styles for sales

Combining engineering science with artistic skill, the GM Styling Section wields tremendous influence on the use of textiles and styling trends on the automotive industry.

BY P. K. THOMAJAN

PULSE AND PACE-MAKER for this great American organization is its Styling Section, which has played a major role in accelerating the appearance and acceptance of General Motors cars.

The GM Styling Section was established in 1927 with the idea of combining the science of engineering with the artistic skill of the stylist. The result, it was believed, would make the automobile not only mechanically better as time went on, but it would also fulfill the human requirements that the car owner desires, such as attractiveness and riding comfort.

General Motors was one of the first in the automotive industry to realize the merits of good styling, both for its market value and its services to the customer who generally prizes his automobile highly. Harley J. Earl, vice-president, has headed the Styling Section since its organization. Today, this section has a personnel of approximately 500, a dozen studios, and wood, metal, plaster, trim, and paint shops.

There is a precise progression in the working schedule of the Styling Section. First comes the sheer doodling stage, where designers are given carte blanche in making up all kinds of fanciful pencil sketches. Sketches that suggest possibilities are made up into water color renderings. As ideas survive various tests, they are made up into full size clay models. From this a hollow reproduction of body, hood, and fenders is cast in plaster, painted and completed with chrome parts, which is the quickest way of finding out how the exterior of a new car will look. Meanwhile, from the clay model dimensions and templates, stylists also fashion a new mockup in wood and metal. This wood and metal model, complete with an interior, is the final prototype of a new car, and, once it is approved, the production cycle begins.

No one model ever achieves complete acceptance. Features that are found desirable are developed further and held for incorporation into future models.

Beauty and Practicality

The Earl attitude toward styling is evolutionary rather than revolutionary. It is a continuous process of smoothly incorporating refinements into GM models. An ideal example of this viewpoint is Le Sabre, General Motors million-dollar laboratory on wheels, which keeps years in the forefront of GM progress — a living model, constantly it is assimilating new modifications. Earl has the difficult task of making cars look like a million dollars and producing them for a fraction of that cost. He is succinct in his observations: "Ours is the problem of getting a blonde that can cook — combining beauty and practicality. To put it another way, styling a car is like writing a play; there must be a driving motivation encompassed by smart lines."

In the credo of this executive-artisan, styling must bear the hallmark of individuality without ever looking eccentric, which invariably cheapens effects. The acid test of good design is that it must be easy to look at. If it disturbs the vision in any way, there's something wrong with it, which calls for improvements or complete rejection.

Constant contact is kept with public taste through a customers' research department, which furnishes reports that play an important part in molding the form of future cars.

Earl is keenly aware of a fashion-conscious America and he sees to it that new models complement the latest vogues. He is responsible for the staging of the annual GM salons. This year's 1953 Motorama, presented in the grand ballroom of the Waldorf-Astoria in New York, eclipsed all previous shows with its futuristic setting and imaginative mood. There were mobiles, space modulators, unique lighting and color effects, a turntable stage on which new GM models paraded with living models — showmanship that conditioned countless minds to early sales.

This moving spirit of the GM Styling Section, who has been a potent influence in making some forty million cars better looking, views each year's models as packages into which he tries to pack all the value possible, such as creating the maximum amount of spaciousness within a car for a given wheel base.

The GM Fabric Picture

The GM fabric picture is an imposing one. This is handled by the Styling Section under direct supervision of Harley Earl along with Fisher and the car divisions. The three million cars built a year by GM consume around thirty million yards of textiles. There is a fabric budget for each car which is kept in the range of its price class, but it is a well-known fact that GM spends more money on its interiors than anyone in the industry.

Interior upholstery for a car includes sidewalls, seat cushions, and cushion backs which are made of wool, mohair, nylon,

(please turn)

The gentleman with the model car in his hands and the look of the future in his eyes is none other than Harley Earl, more than anyone else responsible for the design and décor of General Motors automobiles. He runs one of the world's greatest and most complicated style studios, personally coordinating its highly exacting and technical operations.

Styling ideas are developed from numerous sketches and include every aspect of design without regard to limitations.

Assessing the result of changes in full scale is done with the aid of accurate measurements made on scale models.

rayon, or cotton fabrics or combinations of two or more of these. Fabrics are also used for floor carpeting, shelf material along the bottoms of doors, headlinings, and certain decorative purposes. Through the years almost everything that could be called automobile upholstery has been tried. Fisher Body has experimented with nearly all types of upholstery material. Today, because of the great strides made by the textile industry in fabric development, the car manufacturer has easy access to a great many proved fabrics in either flat or pile weave in an almost unlimited assortment of patterns and colors.

In the use of trim material in today's car, those responsible for their selection must keep in mind that the quality should be excellent and that the car owner is entitled to reasonable satisfaction in wear and continued good appearance. To this end a great many tests are performed by laboratories on specialized *torture* equipment and the results are carefully observed and evaluated by a staff of highly trained technicians.

Before new interior trim is introduced in a body by Fisher, stylists, engineers, laboratory experts, and sales executives spend many months of work selecting and testing the fabrics.

First step in the process starts with the Styling Section, through which manufacturers present their fabrics for General Motors automobiles. The Styling Section reviews literally thousands of samples for each fabric to be selected. In most cases the fabrics are presented by the manufacturers after a brief explanation as to what is sought in the particular fabric. In many cases GM stylists will sketch out a design and suggest that something similar is desired.

When thousands of blanket samples are gathered, all are considered together by Styling Section. Anywhere from several to a dozen may be selected and orders put through to hand-trim them in special bodies. When the trimmed bodies are ready for presentation, engineers from Fisher and engineers and sales executives from the car division concerned are called in and, with the stylists, make the decision as to the fabric to be used.

Analysis and Testing of Fabrics

Before production is started on a new order for fabrics, the rigid General Motors specifications are given the manufacturer. They include specifications as to fiber content, weight, thread crossings, color fastness, strength, and finish.

When new fabrics are considered by the Styling Section, samples of them are sent to the Fisher Body Engineering Laboratory for exhaustive analysis by trained technicians there.

Wear testing of the materials is done on an abraser, which in a matter of several days will create as much wear on the material as it would undergo in years of use in an automobile.

Another method of condensing a test into hours is in the use

The development of the styling of today's automobile is a precision matter embracing every part from bumper to grill.

The designer learns to think on the scale of a model and to visualize accurately what the end result of his work will be.

The production of highly finished scale models in plaster facilitates try-out of many different color schemes.

An important question is what the customer's reaction will be to new ideas, new lines, new fabrics, and new styling.

of a fabric friction tester. This device has an oscillating drum which rubs against three half-moon arms. A typical suit fabric is placed on the drum while samples of seat fabrics are placed on the arms. Results of this demonstrate how well a fabric will hold up against clothing, and, also, how much it will or will not wear on the clothing itself.

Among other tests conducted by the laboratory are a tensile test to determine the tearing point of materials, fiber analysis stretch tests, and thread counts.

Results of all testing are dispatched by the laboratory to the Fisher trim department where results of the examinations are matched against the specifications set up in advance as to what standard the materials must meet to be considered for use in a body by Fisher.

After the months of preparatory work are out of the way and the chosen fabrics have been selected, orders are placed with the manufacturers for the materials. When they are received at the body fabricating plants, they are matched against the master samples from which they were selected, and additional cuts of them are tested to insure that they meet the specifications.

Even when the fabrics go into the bodies by Fisher, careful consideration does not stop. Body experts watch the work being done by the craftsmen who install the fabrics on the seats and in the bodies. Inspectors all along the body line check to see that the work meets the high specifications set up by Fisher in body production. And so, many, many months after first consideration is given to new model fabrics, they begin to come off the production line and are only a matter of days away from the prospective buyer.

The upholstery of cars has come a long way since the days when velour and plush were the vogue. These materials were hot, heavy, hard to clean, and difficult to move on. The next fabric phase was that of finished broadcloth and whipcords, which were better looking and lent themselves to greater versatility in design. Then, as cars became lower and running boards were eliminated, there developed an increased desire for fabrics that held one in position and also permitted one to slide on them.

Use of New Fibers

As far back as 1940, Earl took the initiative in promoting the use of man-made fiber fabrics for automobiles. At that time, he went to DuPont and got them started in developing suitable materials for GM cars. Ensuing results have been most satisfactory. The new fibers have proven tough, durable, attractive. They are in line with big production and yield more for the given dollar than wool and cotton mixtures. There is a pronounced tendency to use nylon fabrics more extensively for they combine good

(*please turn*)

An early step in the designing of a new model is making a full scale rendering in color by skilled draughtsmen.

La Parisienne, presented by Pontiac in the 1953 showings is typical of the high style General Motors achieves.

A crowd of distinguished guests watches the General Motors display of 1953 models in which harmonious styling reached a new peak.

GM Styles for Sales... continued

appearance with weaving qualities. Furthermore, nylon is washable and doesn't *grab* on clothing.

Colors in current use reflect a scaling down in intensity and a trend toward softer or muted tones. Lighter colors appeal to women buyers and they make an interior look more spacious. Interior color schemes harmonize closely with body colors, and combinations are available in a generous variety.

General Motors fabric demands, in order of their importance, are: 1. Ease of cleaning; 2. Durability; 3. Slidability; 4. Color fastness; 5. Wrinkle-resistance. Many of the 1953 GM cars feature foam-back carpet, a new type of carpeting that has foam rubber backing which is an integral part of the carpeting itself. This new process of integrating foam rubber with the carpeting has many advantages: water will not penetrate the rug, thus offering quicker drying; and dirt and dust cannot infiltrate the carpeting, making easy vacuuming possible. Furthermore, tests have shown that carpeting is more durable when placed over foam rubber. No binding of edges is necessary with this new process, and since color can be incorporated in the foam rubber to match the carpet, no unsightly edges appear.

Harley Earl maintains an open-door policy in his department. Those with something to offer get full attention, and their claims are put to rigid tests. If what they have possesses true virtue, they usually get their rightful reward. "Ideals are no respecter of persons," observes Harley Earl, "but we have a high respect for those who have them. Without them, there would be neither change nor progress." ***END***

An experimental Starfire Oldsmobile in which streamlining of the body lines is matched by turquoise blue and white color harmonies.

Test Tube Fabrics for Detroit

How the textile engineers of Burlington Mills approached the development of all-synthetic fabrics for the automotive industry.

THERE IS AN INDUSTRIAL EMPIRE, whose capitol is Detroit, that is one of the marvels of America. In 1953 this industry will turn out over 6,000,000 automotive vehicles, all the way from perky jeeps to Leviathan trailer trucks. Fabric requirements, just for the interior of passenger cars, will run up to 180 million dollars. That does not include textiles used for tires, convertible tops and various lining purposes. Such is the market that Burlington Mills and other fine firms began to survey in the late forties.

An Impressive Market

Aside from its impressive dimensions, this market displayed many other highly attractive characteristics as a potential outlet for synthetic fabrics. One does not have to be much of an expert to appreciate this fact. The very nature of his business forces the automobile manufacturer to be among our most efficient producers. There is no such thing as the rule of "by guess and by gosh." Everything is engineered, down to the smallest ingredient product. All supplies are bought on stringent specifications and accepted only after rigid performance tests. Costs must be predictable far ahead. If you cannot plan about two years in the future, you are not geared to work with Ford or Chrysler or General Motors. What's more, these giants of the world on wheels are just as competitive as they are cost-conscious — always looking for something more advanced at better economics.

The approach to this market that was finally adopted by the Burlington management was to develop fabrics of 100% synthetic content, not as a substitute on an economy basis, but for their special ability to be engineered and for their functional advantages: increased abrasion resistance, elimination of moth and mildew damage, reduced soilage, predictable costs, controllable quality, and endless versatility in styling. It sounds like a tall order, and that is exactly what it turned out to be.

Not until 1950 were Burlington's first all-synthetic fabrics for the automobile industry accepted, after what seemed like interminable delay. Why was so progressive an industry so slow to take on a new idea? That's hard to answer, except that high stakes breed great caution.

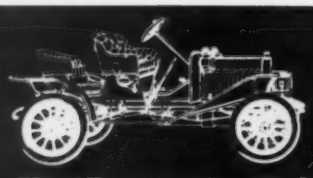
Fortunately, performance tests don't lie, and the automotive industry operates on the basis of these tests. That is how the first sale was made by Burlington. It consisted of a blended sidewall body fabric of acetate and viscose. This was soon followed by an upholstery fabric which not only introduced definite economies, but showed considerably stepped-up abrasion resistance and other improved performance characteristics, not to mention a pleasing hand. The cloth in question was 50% viscose, 35% acetate, and 15% nylon, the last component more than doubling the fabric's strength.

Stability and Control

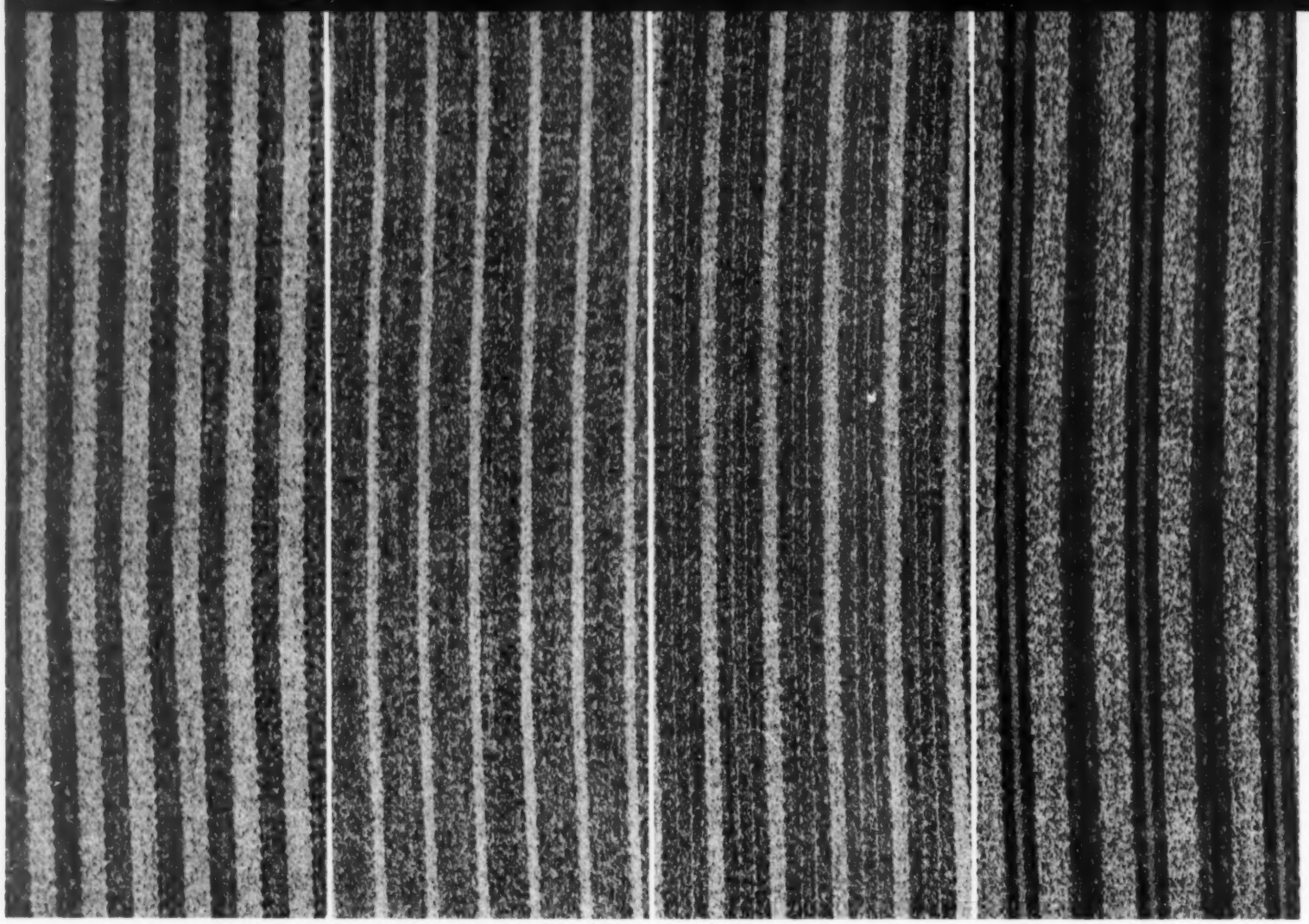
From this small beginning there has been great growth. The reasons why have become increasingly apparent. The advantages of complete control loom larger and larger. Man-made fibers not only assure price stability, but also stability of supply and maintenance of quality. The resultant fabrics are planned and engineered and controlled no less than the automobiles for which they are destined. You can even control the degree of luster. Further than that, it has been possible to control qualities that are definitely contradictory. For example, a cloth has been made combining the fashionable rough texture with the *slidability* (as the Department of Agriculture calls it) that women seem to want for automobile fabrics.

It is all strictly Big League stuff, as you would expect when you are dealing with one of the largest industries in the world. Exactness and technical correctness are a fetish. How else could it be? Think what would happen if some latent defect turned up six months after the 1953 models were on the road. Try to picture hundreds of thousands of cars bouncing back.

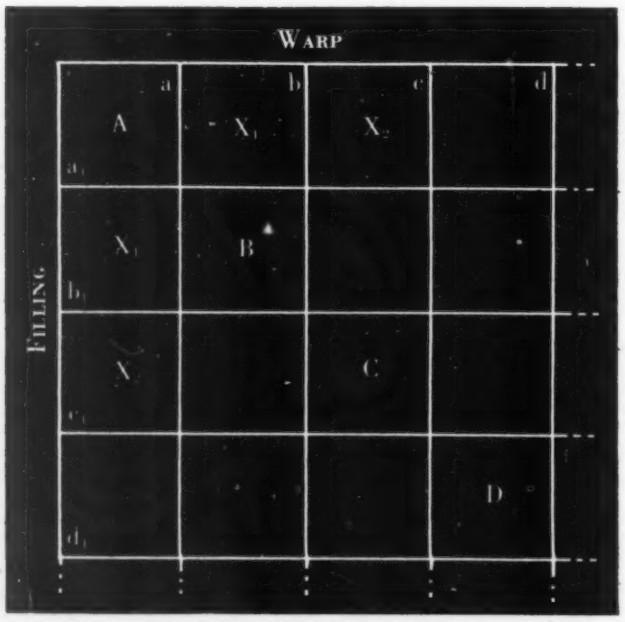
Here is another crucial point. If the mill is wrong, there is no second chance to be right. No one has been able to dream up an



Steps in the Evolution of



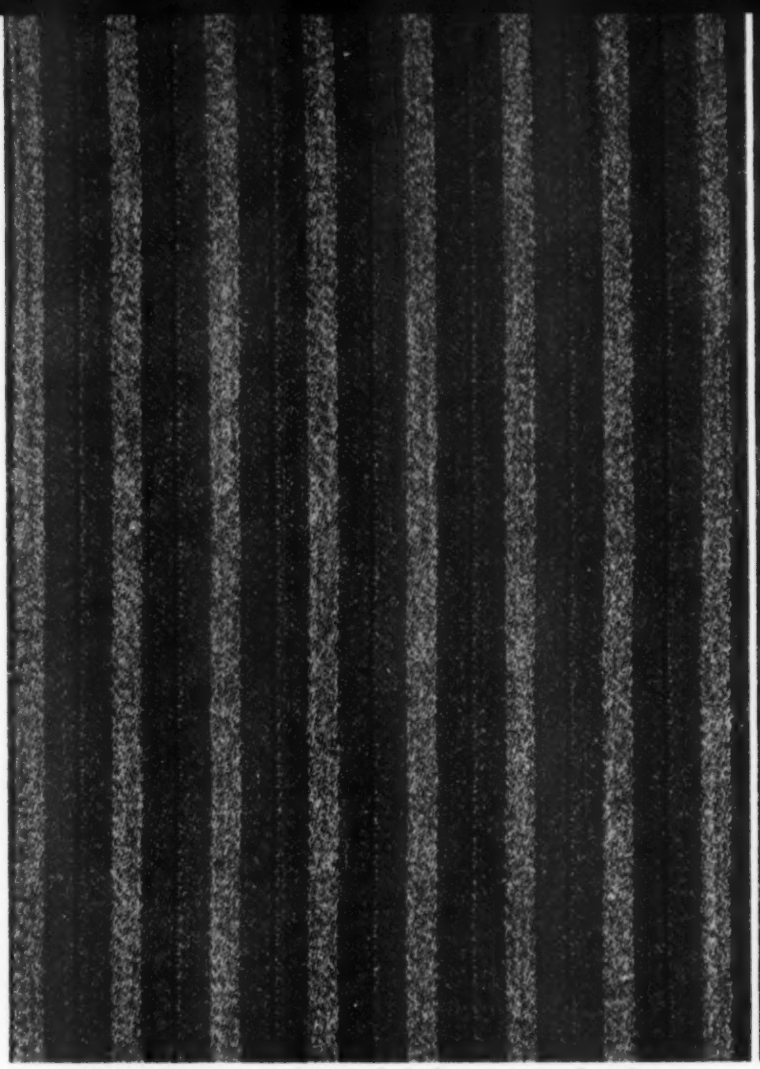
Four samples taken from a single blanket which show a variety of stripe effects related by a single overall design concept.



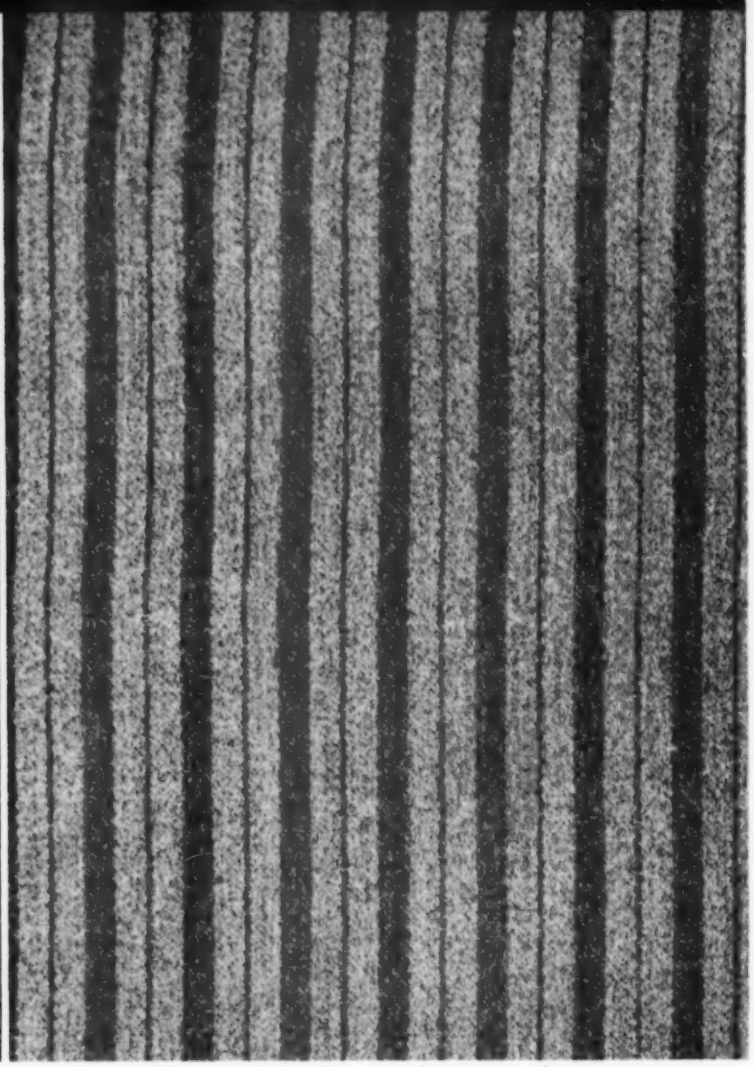
How the textile designer and the automobile stylist cooperate to create a fabric that will fulfill the most exacting standards of style and service to the consumer.

1. The designer, after planning on graph paper a series of new upholstery fabric designs, has them set up on the loom in the form of a *blanket*. This consists of a number of different warp arrangements a, b, c, d, etc., woven with a corresponding series of fillings a_1, b_1, c_1, d_1, etc., to form the planned designs A, B, C, D, etc. on the blanket. The other sections of the blanket X_1, X_2, etc., which comprise the unplanned designs, result from this process and are known as *bastard* weaves. They often contain patterns of interest which can also serve as the basis for the development of new fabrics.

an Automobile Upholstery Fabric



The small stripes are eliminated, the heavy ones made wider.

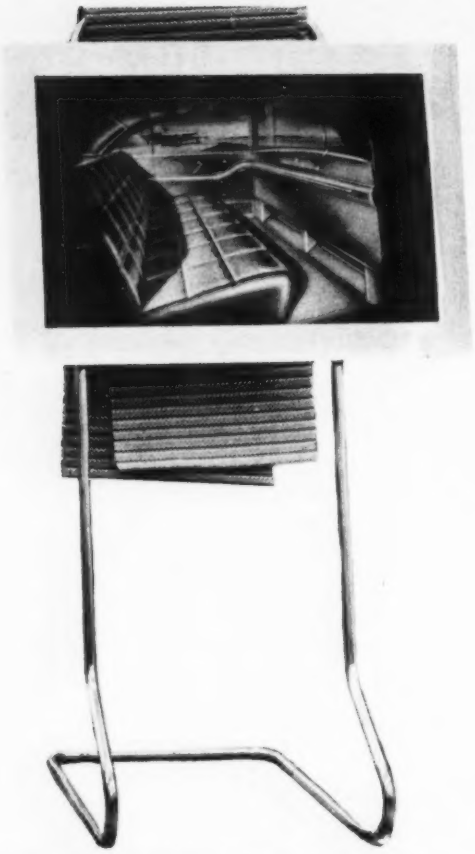


The final design with blends reversed, reversing the pattern.

2. A number of these blankets are shown by the mill representatives in Detroit. Among these samples, which may number a handful or a hundred, certain patterns prove to be of interest. At left are shown four samples from the same blanket, of which the one at right was selected. The elimination of two fine stripes and a strengthening of the design were asked for. After making these changes the mill came back with the sample shown above. The dark portion is rayon; the light, acetate blend; the indented line, rayon filament; the overall color effect is obtained by piece-dyeing.

3. After further test and evaluation, this general design was approved. The mill was asked, however, to reverse the yarn blends except in the case of the rayon filament stripe, which was retained. Also 15% of nylon was added to give improved wearing quality. In terms of piece-dyeing the result was to reverse the color proportions and give a lighter, brighter effect. Such a change may have important significance in terms of overall styling. The final design, shown above, was fully justified by customer acceptance in one of the major lines.

Rayon, acetate, and nylon auto upholstery fabric with 100% rayon filling. A two-tone fabric in a broken chevron pattern with decorative filament-stripe effect. By Burlington Mills



Showing how upholstery fabrics of the future are engineered and styled for interiors of the future.

alternate purpose for which rejected fabrics can be sold. There are other vital considerations that tend to raise the ante so as to discourage all but the most efficient producers. Sampling costs alone are so high that they could hardly be borne by a marginal mill. Extensive facilities are needed: a styling department, a designing department, a fabric engineering department. Textile machinery must be set aside for development work; not only spindles and looms, but also dyeing and finishing equipment. Endless experimentation is part of the price of success.

Constant Contact

Constant contact with Detroit is inherent in the process, for the manufacturers of automobiles have their own fabric stylists and designers, their own textile engineers and laboratories. You can hardly over-emphasize the pressure on all concerned to keep coming up with something new, different, and striking.

It is consequently not surprising to learn that there are only about twenty-five mills engaged in the manufacture of fabrics for the interior of passenger cars. Relations with customers are extremely interesting. It is an axiom that there must be at least two fabric suppliers for each fabric used. Risks in case of curtailed production for any reason whatsoever are too hazardous to permit any other arrangement. In the case of the largest selling cars there are generally four or five fabric suppliers. To be sure, the originator of the cloth gets the preference and the lion's share; but by the same token he inevitably incurs competition.

A stabilizing influence is the staunch loyalty of the automobile industry to the suppliers, though the purchasing agents are of necessity exacting to the nth degree. There is little margin for error, but also no shopping around in the usual market sense.

What is the current status? Look at the new cars and see for yourself. The constant brightening of the entire American color scheme, which is one of the most conspicuous modern developments in our homes as well as our apparel, is now carrying over to the family car. You see colorful evidence of this trend in the new hard tops and just as unmistakably when you open car doors to look within.

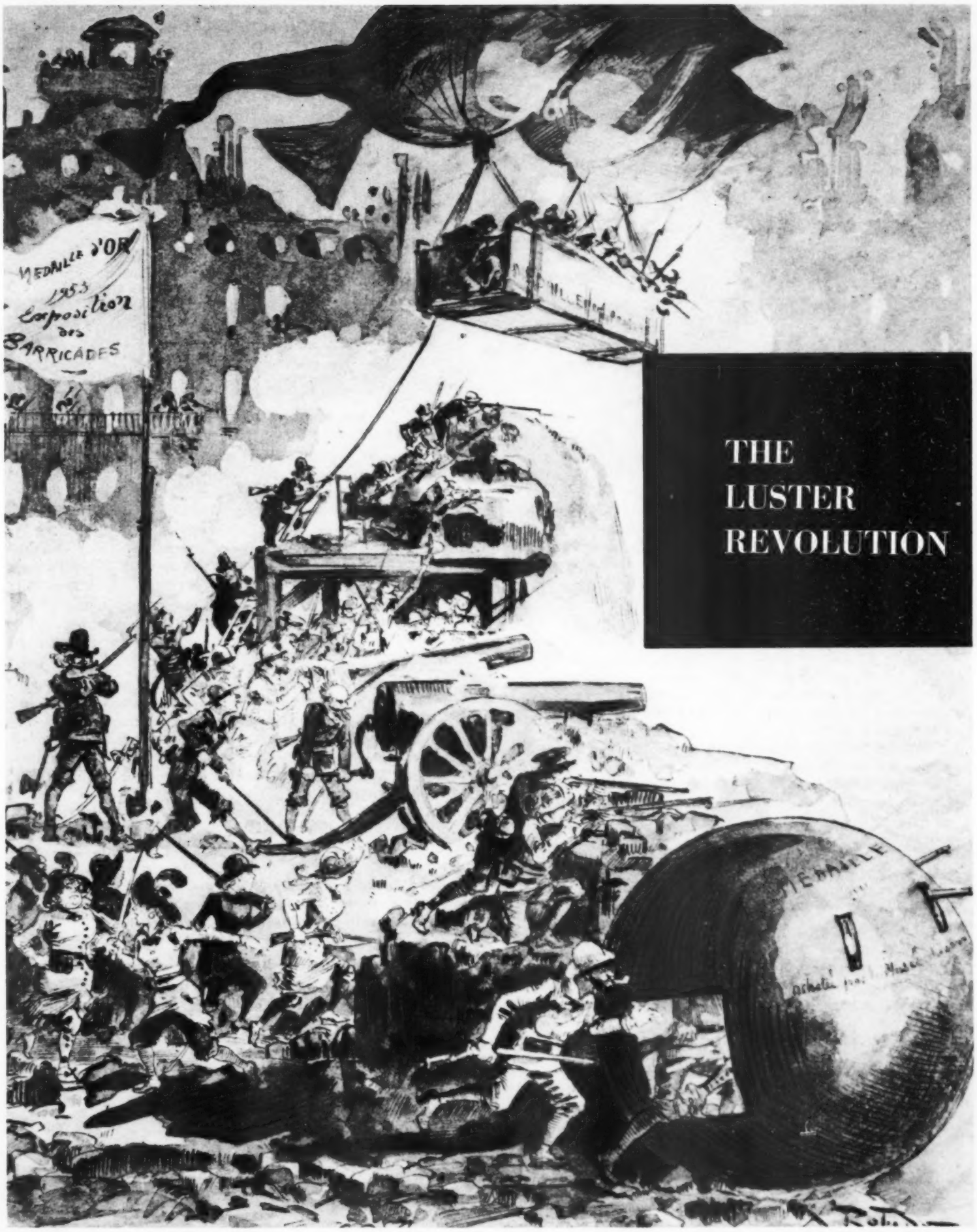
In addition to their gay colors, it is reported that automotive fabrics have become influenced by home furnishings. It's a case of our old friend, diversified Texture Interest, getting into the style picture again.

Looking Ahead

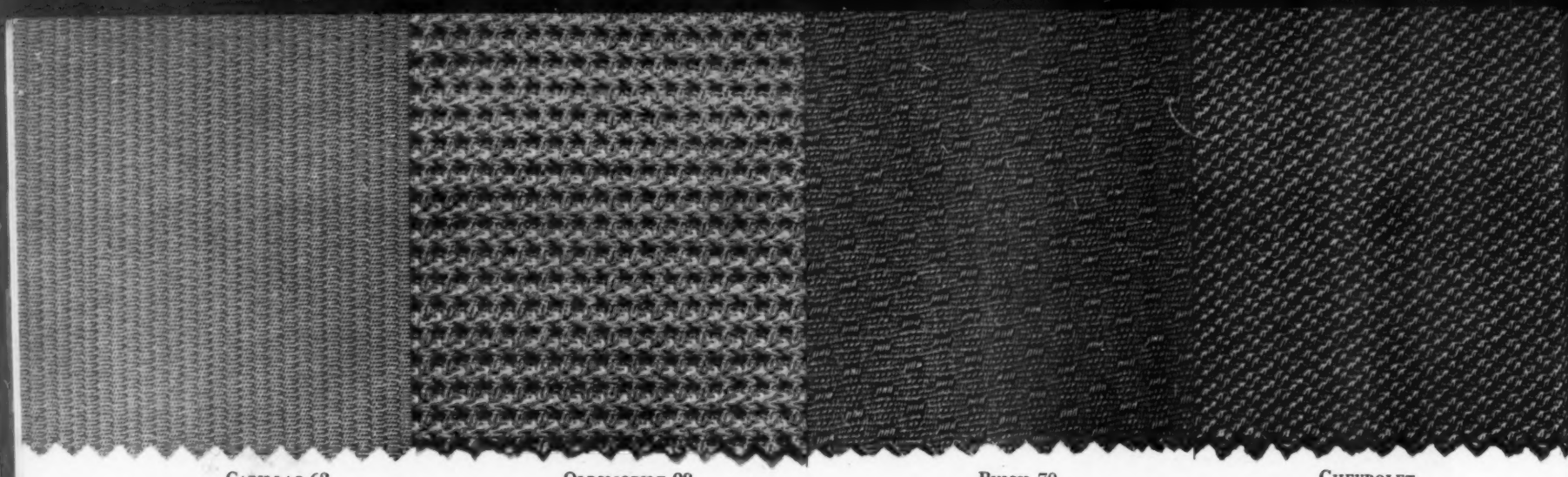
But 1953 has been a closed book for a long time as far as automotive fabrics are concerned. By the time this issue of AMERICAN FABRICS gets into your hands final fabric selections for 1954 will have been made, and the mills will be already working in terms of 1955. That gives you an idea of the kind of forward thinking and advance planning this particular job takes. All in all, the production of automotive fabrics reveals the textile industry at its best: in research, experimentation, special styling, functional designing, blending of yarns, processing; in short, textile engineering in the most constructive sense.

With the now broad acceptance of synthetic and man-made fiber fabrics in the automotive field, Burlington Mills and other leaders can be justly proud of a great textile achievement • *END*

Coming fabric events cast their shadows before them in special models in which looks, tailoring, and durability are tested.



THE LUSTER REVOLUTION



CADILLAC 62 OLDSMOBILE 98 BUICK 70 CHEVROLET

Nylon-faced fabrics used in today's automobiles which are distinguished examples of the luster revolution . . .

THE LUSTER REVOLUTION

WHETHER WE REALIZE IT or not, we are in an era of luster revolution as far as automobile interiors are concerned. This is made possible by the availability of new man-made fibers which are ideal for use in automotive upholstery fabrics. These new fibers, because of their innate worth, have greatly increased the prestige of synthetic fibers. The scope of design has been greatly expanded because their inherent values increase the numbers of fibers that can safely be used in the manufacture of automotive fabrics.

Some of the man-made fibers have been in common use in many textile fields for quite a few years, but the wide use of synthetics in the automotive industry is of recent origin and has been accelerated by the inherent value of the more recent fibers such as nylon. Changing concepts of design, too, have speeded this revolution for, with the introduction of more luster, life, and color to automotive interiors, it was almost essential that these sparkling fibers should be used.

Through the years the three principal fibers which have been used in the manufacture of cloth for automotive upholstery have been wool, cotton, and mohair. Fairly recently, and to a somewhat limited extent, acetate and rayon were added to this list, and, more recently, nylon and orlon. Additional man-made fibers are appearing experimentally in increasing numbers. More than 70 entirely new fibers have been produced in some small laboratory or in pilot plant quantities. The eight synthetic fibers which are now offered or soon will be offered in commercial quantities include Dacron, Dynel, Acrilan, X-51, Perlon, Kuralon, Saran, and Vicara.

Other fibers now in the laboratory development stage are due to make their appearance in the next few years. Before these fibers are accepted, they will have to prove their worth. None will be adopted because they are new or have been described by publicity men as *wonder fibers* or *miracle fibers*. Some will not be successful; each one will stand or fall on its own merits.

There is no fiber which answers the purpose of the automotive stylist and the textile engineer for all end-uses. Each of the fibers, including the natural fibers, have individual characteristics of outstanding merit, but for one reason or another none of them are suitable to all textile applications. In addition to the individual merit of any particular fiber, textile engineers have found that combinations of these fibers yield properties not possessed by the individual fibers themselves.

* * *

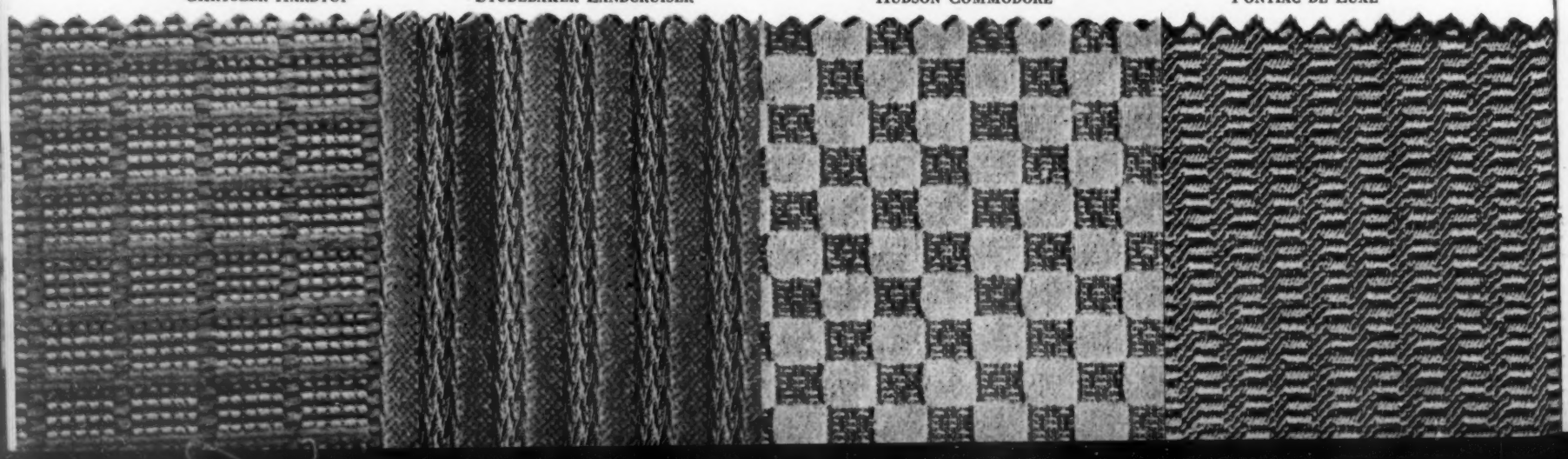
The number of possible mathematical combinations of man-made fibers with other man-made or natural fibers is very large indeed. When we consider the various forms in which the synthetics are available, the several methods of preparing yarns, the possibility of varying the percentages of fibers within the yarns, the many fabric constructions and methods of dyeing and finishing — the total possible combinations and variations with which a stylist can work become practically infinite.

On this page are shown some examples of the new lustered styles which have been successfully achieved and have found acceptance in a range of fabrics made from nylon. Perhaps no single man-made fiber has contributed more than nylon to the *Luster Revolution*, because it so well combines the five major attributes that must be considered in the selection of a fabric . . . appearance, cost, performance, comfort, prestige.

**Excerpts from a talk given by Mr. W. F. Bird before the Body Materials Group of the Society of Automotive Engineers, Detroit. Fabrics shown are from Collins & Aikman's 1953 automobile upholstery fabrics line.*

Lustrous fabrics which are designed to harmonize with chromium fittings and glossy bodywork . . .

CHRYSLER HARDTOP STUDEBAKER LANDCRUISER HUDSON COMMODORE PONTIAC DE LUXE



6 Million Cars in Year Now the Detroit Goal

By JOHN ROGERS

Increased production this year is the outstanding topic in Detroit automotive circles right now. If ... for ...

MARKET BAROMETER

ASSOCIATED PRESS STOCK AVER...

	Yester-day
30 Industrials	149
15 Rails	
15 Utilities	

...week, Steel ... 10... na... prev... Marc...

A l... the ...

...er, numerous factors to stimulat... demands which were present in 1952 will be lacking this year. This means that merchandising divisions will be called on to do a much ... selling job than at any ...

With merchandising divisions being called upon to do a bigger job than ever . . . new developments such as the foam-rubber-backed non-slip floor covering shown here, by COLLINS AND AIKMAN, *will play an important role.*

Estimate of the New Fibers in relation to Automobile Use

Nylon

APPEARANCE	Excellent
COST	High but Stable
PERFORMANCE	
Abrasive Strength	Very High
Ease of Cleaning	Very Good
Color Affinity	Good
COMFORT	Satisfactory in Proper Weave
PRESTIGE WITH CUSTOMERS	Very High

Nylon was introduced into the automotive field in 1948 and its ready acceptance and performance have been nothing short of spectacular. Because it is available in both staple and filament, as well as in various degrees of brightness, almost any desired effect can be achieved in fabrics made from this fine fiber. Though its price is high, its great prestige with the public and its superior performance make it the most desirable of current fibers. It has high tensile strength and great resistance to abrasion. It is highly elastic and recovers well from stretching. It washes easily and dries quickly. It has excellent resistance to mildew, insects, sunlight, heat, and perspiration. The supply is fairly good and rising at a moderate rate. Because surveys show almost universal satisfaction among owners of nylon-trimmed cars, its current wide use in automobile upholstery will continue and probably expand as the supply increases.

Orlon

APPEARANCE	Excellent
COST	High but Stable
PERFORMANCE	
Abrasive Strength	Excellent
Ease of Cleaning	Very Good
Dyestuff Affinity	Low
COMFORT	Excellent in Proper Weave
PRESTIGE WITH CUSTOMERS	High

Orlon is the one acrylic fiber derived from acrylonitrile. Though its use in automobile upholstery has been largely that of decoration, it has characteristics that make it very desirable for automotive use. It has superior resistance to sunlight. Its superior bulking power permits production of handsome fabrics that are warm and durable. Orlon is easy to wash and dries quickly for the reason that it is even more water-repellent than nylon. To date it has been difficult to dye and this property has been used to achieve interesting pattern effects. The price is high but stable, and the supply is moderate and rising. Its acceptance by the public has been excellent in other fields and indicates acceptance for automotive upholstery.

Dacron

APPEARANCE	Good
COST	High but Stable
PERFORMANCE	
Abrasive Strength	Very High
Ease of Cleaning	Very Good
Color Affinity	High
COMFORT	Excellent in Proper Weave
PRESTIGE WITH CUSTOMERS	High

Dacron is a polyester fiber which is characterized by superior wrinkle-resistance, crease recovery, and unusual resilience. It has very little stretch and rates next to nylon in tensile strength. It possesses excellent resistance to abrasion and to other wear factors. Its color fastness is very good and it has good resistance to mildew and will not be attacked by moths. It has good draping quality and is warm to the touch. It washes and dries easily for the reason that its water absorption is less than that of all other fibers. Because of that it is difficult to dye. However, a new class of dyestuffs has been found which will produce shades comparable to the best vats on cotton. The price is high but stable. The supply is small and it will not be available in even moderate quantities before early 1954. Its largest immediate market, present indications suggest, will be in the field of men's and women's suitings.

Dynel

APPEARANCE	Good
COST	Moderate
PERFORMANCE	
Abrasive Strength	Fair
Ease of Cleaning	Very Good
Color Affinity	Fair
COMFORT	Good
PRESTIGE WITH CUSTOMERS	Not Well Known

Dynel is classed as an acrylic fiber. Because of its 60% vinyl chloride content, it has superior resistance to burning and is little affected by acids and other chemicals. It is characterized by good bulking power, good wrinkle-resistance and crease recovery, good drapability, and moderate resistance to wear. It is warm to the touch, washes easily, and does not shrink after contact with water. It is, however, susceptible to shrinkage with heat and must be handled through textile processes at relatively low temperatures. Shades of moderate depth and fair light fastness may be achieved by conventional means, but heavy shades require special dyeing techniques. The price is moderate and stable. The supply is only fair but is increasing. A new modification of Dynel with properties more like Orlon will soon be available. This new fiber will be much more heat-stable. The values of Dynel, it is believed, need only more customer education to place it high on the list of accepted fibers.

The fibers Acrilan, X-51, Perlon, Kuralon, Saran, and Vicara do not appear to rate much consideration at this time in the automotive upholstery field, though Saran, a filament yarn, is widely used in the manufacture of slip covers.

FIRST PRINCIPLES OF INDUSTRIAL FABRICS

What they are . . . where they fit
in the World of Textiles

IT IS SAID that the prehistoric man who decided to make a sail for his boat rather than propel it with a paddle was the inventor of the world's first industrial fabric. That happened some 6,000 years ago, but sailcloth and canvas coverings continue to be important items in the great ship building industry.

For all its antiquity, the boat sail is still an excellent example of the direct use of a fabric in an industry, as described by George B. Haven in his *Handbook of Industrial Fabrics,* the only book on the subject. Other direct uses are everywhere about us: baggings, coverings, beltings, book bindings.

Then you have the great group of fabrics that are employed during the course of production or processing, for such purposes as buffing, insulating, filtering, ventilating, laundering.

A third category covers fabrics which go into the composition of other products: shoe cloth, tire fabrics, typewriter ribbons, coated materials, textiles for plastics.

So far so good. It's when you get down to cases that the fun begins. For example, according to a Department of Commerce compilation, linings for apparel purposes are listed as industrial fabrics. Professor Haven goes along with this definition on the ground that the linings of garments, as well as other articles, serve to prevent wear on one side of the fabric, and at the same time present a glossy, slippery surface, thereby facilitating the use of the garment and increasing the comfort of the wearer.

There is widespread dissent from this view. Though the manufacture of clothing is most certainly an industry, and one of the biggest at that, and though the lining of a garment is patently an ingredient product, you cannot get around the fact that nobody thinks of linings as industrial fabrics. In actual practice they are always regarded as apparel fabrics; and actual practice, we submit, must in the last analysis be the determining factor in every practical, workable definition.

Functional Properties

The fact that cloth used for work clothing is classified as an industrial material generally puzzles people outside of the textile industry. *It's made for clothing, isn't it?* they say. Yes, but a special kind of clothing needed for the protection and comfort and efficient performance of workers and farmers. In this connection we must set up special classifications for industrial uniforms worn by gas station attendants, bottling plant employees, delivery men; for institutional uniforms worn by hotel and hospital personnel; for service uniforms worn by soldiers, policemen, firemen.

Many of the fabrics involved are likewise extensively used for other than industrial purposes. For example, regular indigo-dyed blue denim, the greatest work clothing fabric of all, is likewise the battle fabric of the Navy and the dungaree fabric

(please turn to page 104)

THUMBNAIL PROSPECTUS
of
AMERICAN INDUSTRIAL FABRICS

Here are some of the subjects that you will be reading about:

QUARTERLY REVIEW: Summary of significant developments, briefs of new technical literature, surveys, results of research, new devices for quality control, and new testing methods.

THE FIBERS OF INDUSTRY: Their properties . . . such as strength, lightness, dimensional stability, elasticity, crimp, dyeability, felting properties, non-conductivity, mildew resistance, thermal characteristics and their special advantages for special purposes.

THE YARNS OF INDUSTRY: Special emphasis on recent developments in the field of yarns such as heavy denier, ply, and high-tenacity yarns; hawser and cable, tire fabric, conveyor belting and webbing yarns; yarn blending and processing.

SPECIAL INDUSTRIAL CONSTRUCTIONS: For military vests, airplane wings, filter cloths, beltings, insulation, brake lining, and other multi-ply fabrics, webbings, and bindings.

SPECIAL FABRICS FOR SPECIAL PURPOSES: Medical fabrics, automotive, book, and laundry fabrics; typewriter ribbons, baggings, processing fabrics, protective and shelter fabrics.

DUAL-PURPOSE FABRICS: Cloths like 80 squares and sheetings that are made for household use and clothing purposes as well as for industry, and, like poplins, that are in use for apparel and for insulated military equipment.

MILITARY FABRICS: More than 10,000 cotton items alone. Existence of special development facilities; special specifications; special requirements in regard to testing procedures; climate-resistant fabrics.

UNIFORM FABRICS: For police, firemen, letter carriers; for athletic teams; regalia for fraternal orders; uniforms for gas station attendants, hotel and hospital personnel, plant employees.

WORK CLOTHING FABRICS: Denims, coverts, chambrays, twills, drills, flannels. For work pants, shirts, coveralls, jackets, coats. Water-repellent, flame-resistant and acid-resistant fabrics.

INSTITUTIONAL FABRICS: Towels, sheets, upholstery, draperies, rugs, napery. Special fire-resistant fabrics, tapes, bandages.

(please turn to page 104)

Industrial Fabrics Quiz

Quiz yourself with the following twenty-five true or false questions concerned with industrial fabrics. Score 4 points for each correct answer, referring to the section below for the proper answers and explanations. Ratings: 88-100, excellent; 72-84, good; 60-68 fair.

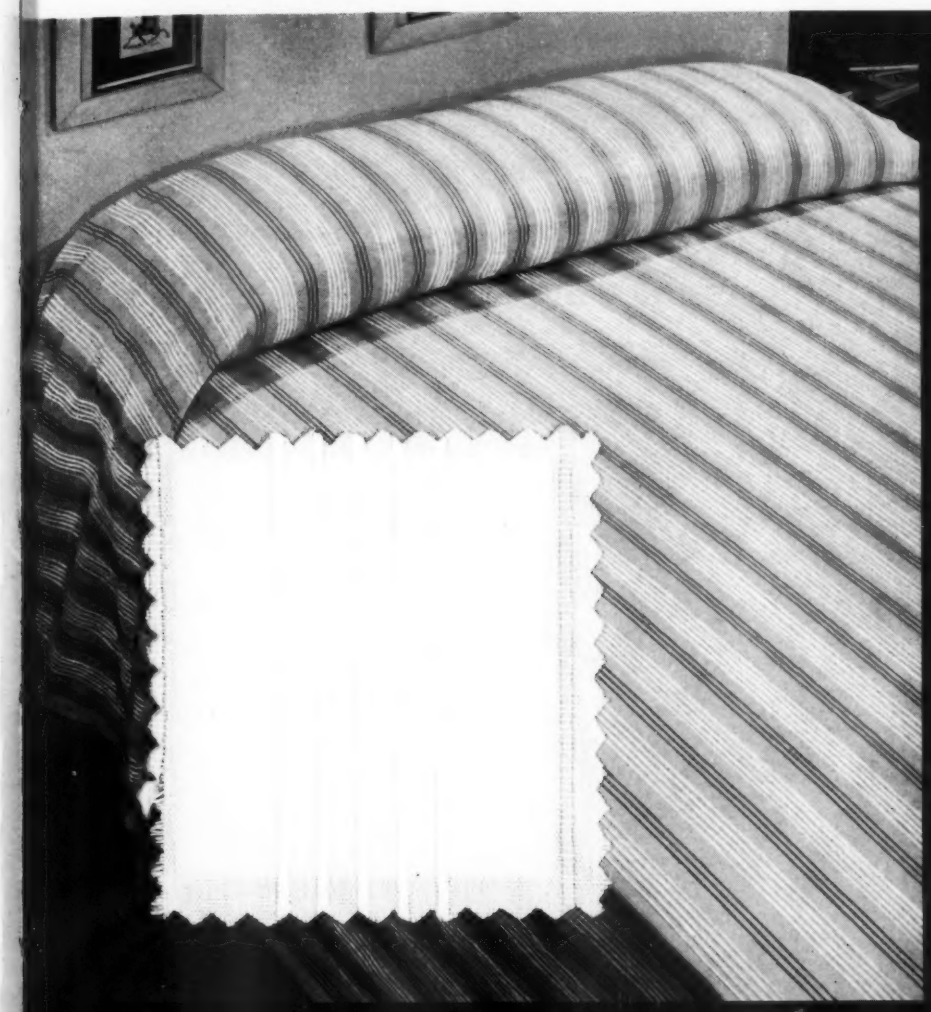
		True	False
1.	The product made by twisting two or more ply yarns together is called cord	____	____
2.	The number of unit weights of 0.05 grams per 450-meter length is known as the denier	____	____
3.	Cotton is an example of a hard or leaf bast fiber	____	____
4.	A unit of length used to determine the yarn number is roving	____	____
5.	560 yards is the standard used to find the count of linen yarn	____	____
6.	Chrysotile is the type of asbestos fiber used, possibly with other fibers rubbed in, to make a single strand without twist	____	____
7.	The number of filling yarns per row of tufts in floor covering is known as the shot	____	____
8.	S-S-Z or Z-Z-S is used in what is known as hawser twist in cord, rope and twine	____	____
9.	A two-ply filling yarn is used in weaving gunny sacking	____	____
10.	Denim is usually made with a 2-up and 1-down, right hand twill	____	____
11.	Burlap in the United States is referred to as Hessian in Great Britain, India and on the Continent	____	____
12.	Short bast fibers removed by hackling are called line fibers	____	____
13.	Heavy duck is limited to a square yard weight of 24 ounces	____	____
14.	The terms, non-combustible and fireproof may be considered as practically synonymous	____	____
15.	A non-flammable fabric may be referred to as being combustible	____	____
16.	Belt duck that is very compact in structure serves as the base for balata duck	____	____
17.	Two decided assets of the ramie fiber are its ability to absorb water and its high tensile strength	____	____
18.	The canal or central opening in a vegetable fiber is called medulla	____	____
19.	A material 8-inches or less in width and having a selvage on either side is classed as a narrow fabric	____	____
20.	Sail duck is always made in a 24-inch width	____	____
21.	Tire fabrics are usually 60-inches in width	____	____
22.	Tobacco cloth is always made in a 36-inch width	____	____
23.	Cotton denims and coverts are made in widths from 28-inches to 30-inches	____	____
24.	An S. F. Duck is one in which the warp is of single-ply yarn	____	____
25.	Osnaburg made from cotton which includes some waste is known as "clean osnaburg"	____	____

True or False Answers

1. True. *2.* True. *3.* False. Cotton is a seed bast fiber. *4.* False. The unit of length is the hank. *5.* False. The standard length or lea is 300 yards. *6.* True. *7.* True. *8.* True. *9.* False. A single-ply yarn is used. *10.* False. Always made with a left-hand twill weave. *11.* True. *12.* False. They are called tow. *13.* False. Some heavy ducks may run to 40 ounces or more per square yard. *14.* True. *15.* True. Such a fabric may burn but there is no flash. *16.* True. Several layers are cemented together to make the product. *17.* True. *18.* False. This canal is called lumen. *19.* False. Line of demarcation is 12-inches. *20.* False. Sail duck is made in a standard 22-inch width. *21.* True. *22.* True. *23.* True. *24.* False. S.F. implies single filling duck. *25.* False. Known as a part-waste or P.W. Osnaburg.

THESE Bates BEDSPREADS ARE AN INSTITUTION!

These three are the best institutional bedspreads made today. They will take hard, daily use and countless launderings. They won't shrink out of size. They are reversible. They wear indefinitely, and they look wonderful every year of their lives



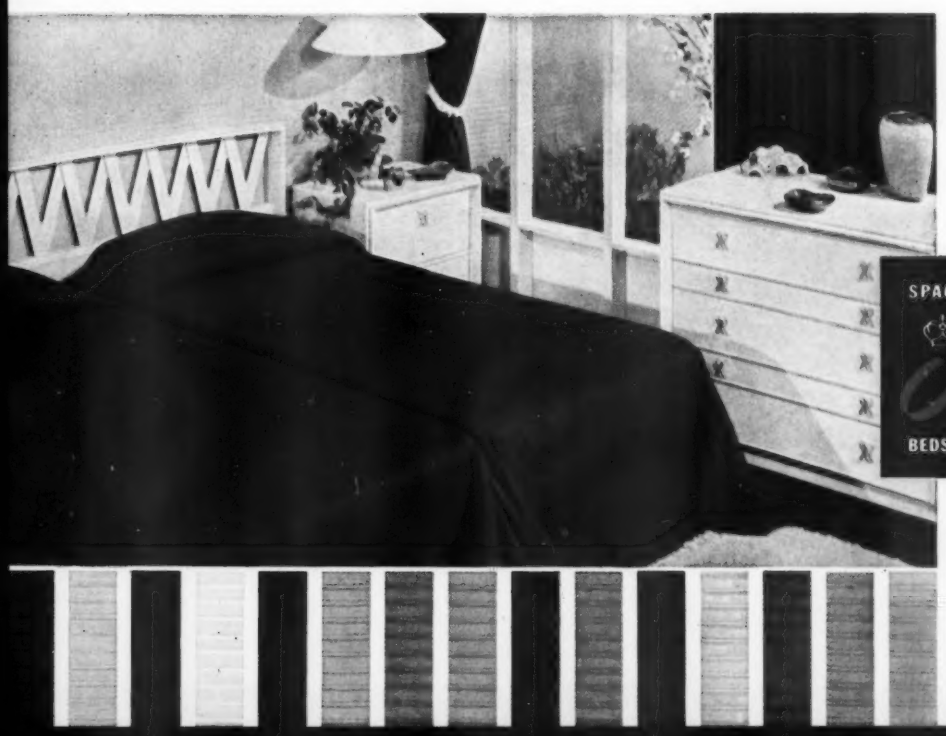
Bates "Ripple Cord" is a ruggedly serviceable bedspread with a "private home" look. Extremely strong corded cotton with smart stripes in white and color or all white has texture interest, color interest. Ironing is optional. Shrinkage less than 4% in length, none in width.

Bates
"RIPPLE CORD" • STYLE 8848
White, Blue, Cedar, Gold, Green.
Sizes 72 x 90, 72 x 99,
72 x 105. 50 or 100 to case.

Bates "Ripplette" meets the most rigid Government specifications. Plump, woven-in ripple, reinforced with eight extra ground threads on each side. No ironing needed. Most economical bedspread for institutional use. Shrinkage less than 4% in length, none in width.

Bates
"RIPPLETTE" • STYLE 200
White only.
12 standard sizes and by th
50 or 100 to case.

Bates "PIPING ROCK" BEDSPREAD AND MATCHING DRAPERIES



designed for today's homes . . .

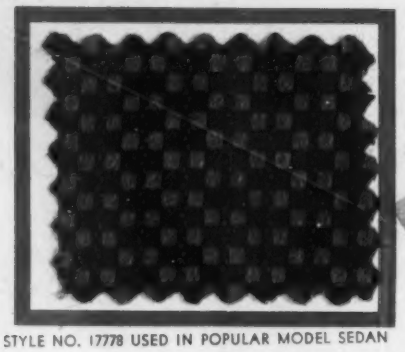
SPACE MAKERS • MONEY SAVERS
Bates
BEDSPREADS • MATCHING DRAPERIES

to make a small room look larger, lighter, lovelier

Bates "Piping Rock" has been bought the millions, for institutions, hotels, l It is beautiful and extremely durable Richly ribbed cotton in white and va decorator colors. Shrinkage less than 4% in length, 1% in width.

Bates "PIPING ROCK" • STYLE 87(
Sizes 72 x 110 or 90 x 110
36 x 90 draperies to match
27 or 54 to case

BATES FABRICS, INC., 80 WORTH STREET, NEW



STYLE NO. 17778 USED IN POPULAR MODEL SEDAN

who said pioneering is dead?

Not Detroit. That's sure. Every year we see evidence of the research and great new ideas developed by the automotive industry.

And certainly not Burlington. Keeping up with the giants of Detroit, Burlington was first to pioneer and perfect 100% synthetic fabrics for automobile upholstery. One of the great textile achievements of the century--Burlington's synthetic blends are results of the never-ending research and quality control in Burlington's laboratories. These perfected synthetic blends match the beauty standards new cars demand...they assure the manufacturer and the customer of longer, much longer wear.

Burlington is ready, willing and completely able to fill the needs of the great Detroit industries.

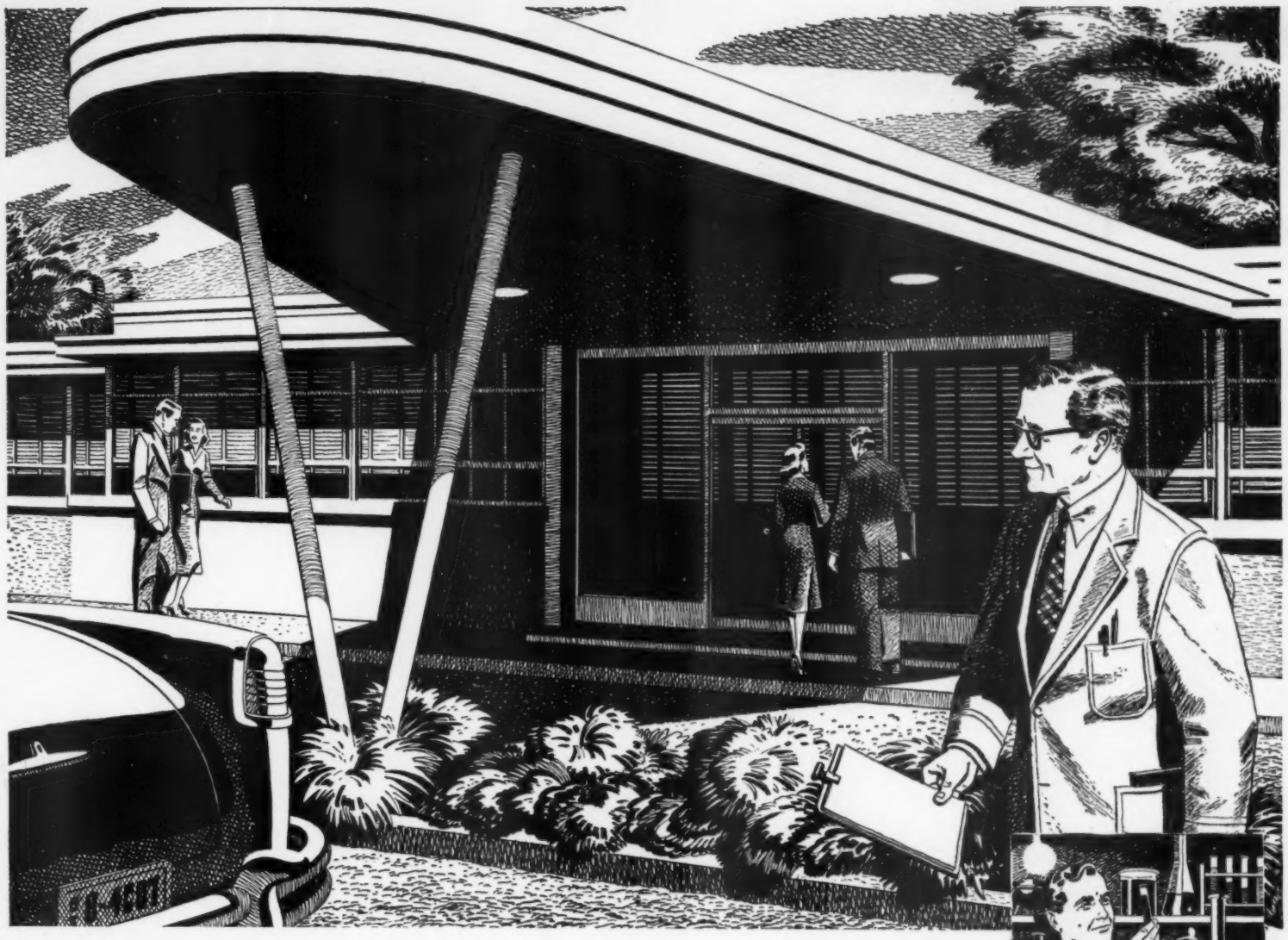
BURLINGTON, LIKE DETROIT, IS ONE OF TODAY'S GREAT PIONEERS--EVERYONE'S GUARANTEE FOR BETTER LIVING TOMORROW.

Burlington

Burlington Mills

"Woven into the Life of America"

INDUSTRIAL FABRICS DIVISION · 350 Fifth Avenue, New York 1, N.Y.



Bring Your Industrial Fabric Problems Here for Modern Solution

Industrial fabric problems aren't as simple as they used to be! The pressing necessity to do every industrial job faster, better and cheaper means that "just any fabric" won't do.

For years an important part of our business at Wellington Sears has been devising special fabrics for special industrial uses. Our measure of a successful fabric is simple: "will it work—longer, better, cheaper?" And we've been satisfying engineering-minded customers to the tune of a hundred million yards a year.

With the introduction of the many new chemical fibers there are many new opportunities for longer wearing, more efficient fabrics.

Consequently, our parent organization, West Point Manufacturing Company, has stepped up research activity, expanded its development staff, and built the new laboratory shown above to house this operation.

Whether you are in the rubber, coating, laminating, automotive, chemical or any other industry—if you've got an industrial fabric problem, bring it to Wellington Sears. You'll be surprised how many "new" problems we've already solved in some other connection.

Wellington Sears has prepared an illustrated 24-page booklet filled with valuable facts on fabric development and applications which will be of interest to present and potential users of industrial fabrics. Write for a free copy of "Modern Textiles For Industry" to Wellington Sears Co., Dept. S-8, 65 Worth Street, New York 13, N. Y.

Chemistry plays an ever-increasing role in the development of textiles.

Testing tensile strength—one of the many checks to insure fabric performance.

Fiber analysis is an important part of a continuing program of textile research.

Wellington Sears

A SUBSIDIARY OF WEST POINT MANUFACTURING COMPANY

FIRST In Fabrics For Industry

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OFFICES IN: ATLANTA • BOSTON • CHICAGO • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

Mesh our
fabric know-how
with your
specialized fabric needs

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Robbins can put the proper man-made fibers, or combinations of them, to work for specialized uses in many industries. These fibers include Nylon, Orlon, Dacron, Acrilan, Dynel, Filament Rayon, Spun Rayon and Acetate.

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What's on the Ship P. A.'s Mind?

Excessive shrinking is the bugaboo of the man who buys fabrics for shipboard use. And no matter what process of shrinkage control is used, salt air can generally make a mockery of it. That's what the P.A.'s claim.

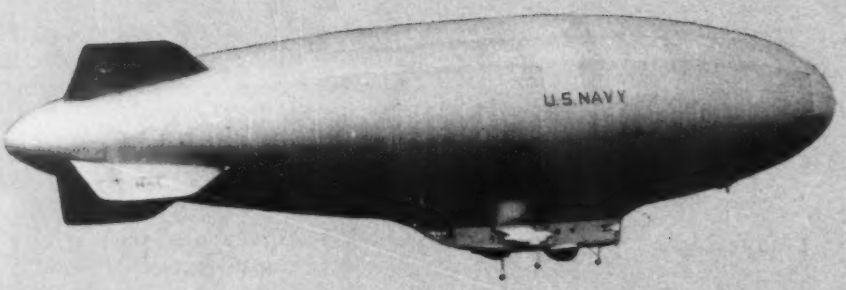
Take bedspreads, for example. Readymades can't be used, by and large, because of oddities in bed construction peculiar to ships' staterooms. They have to be custom-made to the tune of $40 or $50 apiece. First, pre-shrunk fabric is bought, with special attention to dyes that will stand salt air. The fabric is washed in the piece a few times. Then the spreads are made. One trip, one laundering . . . and the neat tailor-made bedspread begins to look like Ichabod Crane's jacket.

Another problem is draperies. Fabric suppliers don't believe it's possible, but the portion of a four-foot-long drapery covering a porthole will shrink an inch or more in one trip while the rest of the drape keeps its length.

Outside of the fabric made to the old Shipping Board specifications, which has no style, there is nothing on the market today to meet all of the P.A.'s requirements. There are no uniform standards for shrinkage, colorfastness, and washability. These are badly needed, particularly since most shipping companies don't feel justified in keeping large fabric inventories. Instead, they deal with jobbers for replacement needs, selecting new patterns each time because the style factor makes jobbers reluctant to carry the same pattern too long. It's an endless trial and error business.

What about new miracle fibers? 100% Orlon drapes are working out quite well. A blend of Saran and Dynel is receiving considerable attention. But, by and large, it's cotton. Cotton in all weaves and weights for drapes and upholstery and bedspreads. Some wool, depending on the ship's run, some blends of mohair, cotton and rayon, and likewise some linen.

SPECIAL FABRICS FOR MILITARY APPLICATIONS



Among the many factors responsible for development of specialized yarns and fabrics, the U.S. Government and its agencies may be counted the most potent. A typical case is that of Fortisan, high tenacity filament yarn produced by the Celanese Corporation, acclaimed the strongest textile yarn for its weight ever produced.

PERHAPS THE REASON why it has played a hidden role is that for almost its entire career Fortisan has been conscripted by the United States Government for military and semi-military uses. Actual production of this super-strong yarn was born of World War II after many years of research and planning on the part of the Celanese Corporation. During the war, the entire output was taken over by the Government. It was freed for civilian purposes for a brief period and then again allocated for defense needs upon the outbreak of the war in Korea.

Throughout this period the big talking point of Fortisan was that it imparted to fabrics — and to other products — qualities of lightness, great strength, and stability. Among its most significant properties are the following:

1. Very high strength; very high degree of dimensional stability to stresses and strains, and to wetting and drying; subjection to wide ranges of atmospheric conditions.
2. A specific gravity of a little over 1.5, which means low bulking power with possibility of packing and storing in limited space.
3. Resistance to the action of chemicals and organic solvents.

Another important property of Fortisan is that it is extremely low in organic content and is normally supplied with only a lubricant of a pure white mineral oil class and thus lends itself extremely well to the electrical trades where low conductivity and very low corrosion properties are essential. All Fortisan passes U. S. Government Specification MIL-C-11997 (Sig. C).

Fortisan yarn came into wide military use when millions of yards of fine, lightweight fabrics, of higher strength than had ever been obtained with silk, were used in the canopies of different types of parachutes. The chutes had to stand up to severe conditions of loading and impact, to function perfectly, and to bear their loads through the air at accurately controlled speeds under widely different climatic conditions.

One of the first objectives set by the U. S. Government was to provide very lightweight flare parachute cloths to replace and to improve in performance the lightweight mommy silks which were in very short supply. A fabric was developed weighing 0.85 ozs. per square yard woven from 30 denier, covered now by Specification JAN-P-498. This fabric, in spite of its lightness, is processed with very high efficiency.

Many millions of yards have been produced, and it continues in extensive production for various types of parachute flares, radio controlled target plane chutes, and the like.

An idea of the very high strength of this light fabric, which is 0.0020" thick, is indicated by the fact that the specification calls for breaking strength of 45 lbs. per inch each way, with additional

production running around 50 lbs. In the parachute field, low bulking power is most important, as space available is limited, particularly in aircraft.

This same fabric, incidentally, is being used for varnished insulation for electric work, high pressure medical bandaging, acoustic dampers and diaphragms, light coated fabrics for microphone covers, etc.

Shroud lines, sewing threads, and tapes went into the parachutes, and the loads they carried varied from flares launched from the air, traveling at very high rates of speed before opening, to radio controlled target planes, where they functioned automatically and bore the plane to the ground safely when hit in practice or after finishing a mission.

Wide Variety in Military Use

There were many other uses, such as balloon valve cords which had to be dimensionally stable under varying conditions of weather; fine strong core threads for tinsel conductors for various radio and radar head sets; heating elements, for flying suits and flying gloves; light, strong coated fabrics; heavy duty cargo parachutes taking thousands of pounds of load; specially light, strong balloon fabrics; heavy, extremely strong fabrics for the base of resin laminates employed in aircraft work; anti-blackout suits for combat pilots requiring high strength and lightness, etc.

> A case in point is the 1.8 oz. rip-stop woven lining. This fabric is covered by Specification MIL-C-10772. Strength, dimensional stability and durability, plus the fact that, like cotton, Fortisan can be dyed with very fast vat dyes, first led to its use for the lining of combat garments, Arctic clothing, etc. More recently, Celanese Corporation of America was advised of further requirements by the U. S. Government and changed over to a spinning dope pigmented color yarn for this production. Many millions of yards of this fabric have been successfully woven and supplied under competitive bids by numerous weaving mills. This fabric has to stand up not only to tough combat uses, but to severe mobile laundering and various technical treatments, maintaining its dimensions, strength, and fastness of color.

This design of fabric, it may be recalled, first found highly satisfactory use as a lightweight cloth for spinnaker sails on sport boats where strength and dimensional stability are important.

Man-carrying parachutes made of Fortisan were assembled and given severe functional and destruction tests both in the United States and in Canada. In these tests Fortisan stood up extremely well and showed itself to be a highly suitable material, standing up effectively to severe military tests imposed both as to functioning in hot, humid weather and in extremely cold weather, and standing up without failure to limiting loads and speeds. Since Fortisan yarn has a higher specific gravity than, for example, silk or other parachute materials, its volume for a given weight is therefore less, and a parachute will pack into a smaller space, which is of obvious advantage.

The high specific gravity, fineness of filament, strength, dimensional stability, resistance to heat, and other properties led to the employment of very fine flexible heating elements and conductors with employment of Fortisan as the core yarn around which the metal resistance or conductor was wrapped. The purity of the product offered a lower electro-conductivity and corrosion factor than had been obtained before. The employment includes electrically heated clothing, heated blankets, radio and telephone head sets, and generally fine flexible conductors. Prior to current government employment, this type of conductor found extensive usage in computing machines, civilian electrically heated blankets, telephone hand sets, etc.

> In addition to numerous applications for strong insulation and core threads, fine ends such as 30 denier of Fortisan are employed for identification and tracer threads in field wire. Manufacturing operations demand a very fine yarn, but sufficiently strong and dimensionally stable to withstand the processing operation. Substantial quantities of low denier Fortisan, dyed in suitable colors, go into this work, which includes civilian application.

Compared with the large volume of commercial textiles, the production of Fortisan was limited and expansion to larger quantities which would have been used to considerable advantage was not practicable.

Government usage covers a wide range from lightweight coated microphone covers, camera bellows, etc., up to heavy duty fabrics rubberized with special compounds for large inflated radomes, small mobile radomes, fabrics in U. S. Navy airships, etc. Strength, dimensional stability, excellent low temperature physicals, chemical inertness, and acceptance of coating all come into the picture. Considerable work has been conducted in this coated fabric field where the peculiar properties of Fortisan were of distinct advantage. For example, high resistance to stretch and the dimensional stability in practical use showed the distinct ad-

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Thousands of yards of super-strong Fortisan are used for the fabric bag of the Navy's giant N-type airship. Shown above is the deflated bag

vantage of using Fortisan for off-set printers' blankets. No stabilizing or stretching of the fabric, as is attempted with cotton, is necessary.

The lightweight fabric employed has naturally fallen into other civilian uses, such as varnished insulator cloth replacing previously used lightweight silk materials; high compression bandaging employed in the treatment of serious burns on the human body; lightweight coated raincoats, babies' panties, dress shields, and some light apparel fabrics and apparel reinforcing fabrics.

Other Civilian Uses

Some of the other uses which may be mentioned are lightweight rainwear, corset satins, fine lace, ninons, chiffons, warp knit underwear, sewing threads, light tapes, typewriter and similar ribbons, tinsel conductor core threads, base fabric for laminates, parachutes, umbrella fabrics, airships, and balloon cloths, life rafts, life vests, strong reinforcing threads for two-way stretch foundation garments, brassiere cloths, strong component threads for one-way stretch swim suits, industrial belting, numerous uses in the electrical field, particularly where strength is required, fine wind cords for radio sets where strength, fineness and resistance to stretch is essential, etc.

> In surveyor's tape dimensional stability to atmospheric conditions and dampness is most important, and 100% Fortisan tapes have obviated the use of the old linen-type surveyor's tape woven with copper wire for holding dimensions as much as possible. This dimensional stability also led to development of very excellent venetian blind tape using Fortisan yarn as a warp and then coating the tape with vinyls of desirable color.

In fabrics which are coated with rubber, synthetic rubbers, flexible resins and the like, for inflated gas retaining devices, the use of Fortisan fabrics is of particular advantage. Heretofore, cotton has pretty well held the field. Not only has Fortisan a much higher strength for a given weight and, therefore, lighter fabrics may be employed, but in its continuous filament form the surface of the fabric is smooth without any protruding filaments to provide a wicking action such as appear in a cotton fabric. By this wicking action the gas employed in the inflated device can escape; and, in order to counteract this, thicker layers of the rubber or other coating material have to be employed on cotton to provide adequate retention. Accordingly, with Fortisan fabrics less rubber or coating material can be employed and therefore greater savings in weight are made.

Coated Rainwear Developed with Fortisan

Excellent coated rainwear was developed with Fortisan fabrics of one oz. weight or less. Numerous developments were carried out on medium and very lightweight fabrics coated with chemically resistant rubbers, vinyls, and the like for laboratory applications, where body protection with lightness of weight is of value. Fortisan was used in low internal diameter high pressure hose and showed advantages in diameter and weight saving with maintenance of very high bursting pressure.

Work has been done on mining and coal conveying belts with saving of weight, improvement of strength, dimensional stability, and control of troughling value. In addition, lightly coated or even uncoated lighter conveyor belts for various manufacturing processes showed advantages of strength, dimensional stability, and weight saving.

There are diversified uses involving strong tapes, fine woven labels, coated perspiration shields, etc. of interest to the industrial fields. An important use also is the use of Fortisan as wind cords in radio and electronic equipment because of its strength and dimensional stability.

Fortisan is a regenerated cellulose yarn produced by highly orienting the internal filament structure of a cellulose acetate or other cellulose ester yarn, and saponifying, that is, splitting off, the combined acid radicals. These operations impart to the fiber extremely high strength, resistance to stretch, and dimensional stability. The processes are such that a wide range of filament and yarn sizes can be produced, and both continuous filament and staple fiber yarns may be manufactured. The filament size, that is, the denier per filament, is currently of the order of 0.75, which is finer than the filaments of natural silk. Commercial yarn sizes currently range from 30 to 270 denier, but future plans include heavy industrial yarn sizes.

> Fortisan materials do not melt, nor are they thermoplastic. They generally have the heat resistance of linen or cotton. Ironing tests show that the first signs of scorching are at a higher temperature than in the case of linen or cotton.

The factors of resistance to exposure, visible light and ultra violet are high in Fortisan yarns and fabrics, which have higher strength, after exposure, than other fibers before exposure.

Fortisan fabric and yarn stand up remarkably well to autoclaving and steam. Twenty-five pounds pressure for as long as five hours has been applied without observably weakening them. On this and other counts Fortisan is of value for the high compression medical bandages mentioned before and has made excellent sutures, being thoroughly sterilizable. Its resistance to steam avoids problems in autoclaving or steam-ageing which printed goods require.

Fast Dyeings Are Obtainable

Fortisan, as a cellulose yarn, dyes with colors employed on cotton and linen, such as direct colors, sulphurs, naphthols, developed colors, vats, etc. Extremely fast dyeings are obtainable. More particularly in the dark shades it will be found that to acquire a given depth of shade somewhat more dyestuff is required for Fortisan yarn than for cotton. To a large extent this is due to its fine individual filaments.

> The dyeing affinity rate and the quality of Fortisan yarns or fabrics can be substantially improved for special purposes by applying the Opus Treatment. This consists of immersing the Fortisan material for brief periods in moderately concentrated caustic alkali at cool controlled temperatures, rinsing thoroughly, drying, and finishing. The very high breaking load is moderately reduced and the amount the fiber will stretch at the break is increased. Resistance to the wearing effects of laundering, which is already high, is still further improved; the rate at which the fiber will dye and the amount of dyestuff it will take up are measurably increased; and in many cases the hand of the fabric is still further improved as to fullness and soft, silk-like hand.

The Opus Treatment is of particular advantage in the sewing thread trade. Fortisan sewing threads which have had this treatment have excellent and extremely uniform sewing results. The sewing trades have long been aware that yarns which have a high, quick, elastic recovery, yet stretch rather readily at low loads, constitute quite a problem in that the tension results in a residual energy in the seam which in turn results in a tightening, puckering, or gathering of the material. Fortisan threads have a very high resistance to stretch and thus this problem does not arise. The Opus Treatment causes a longitudinal contraction of the yarn, a moderate reduction in breaking load, and substantially higher elongation. Resistance to stretch, however, still remains very high and this, coupled with the higher elongation, improves sewing qualities, does not lower the stitched or looped strength, and increases the resistance of the seam to ripping.

Printing presents no special problem, and all usual types of print have been applied to Fortisan fabrics with success • *END*

What's on ASTAPA's Mind?

Of course you know what ASTAPA is? It stands for Armed Services Textile and Apparel Procurement Agency that has been operating since October 1, 1952 under the ægis of the Department of Defense. This is unquestionably the purchasing agency to end all purchasing agencies. It is run by the Army, Navy, Air Force, and Marine Corps, and staffed by officers and civilians.

At the head of the organization is a directorate consisting of The Quartermaster General of the Army, The Chief of Bureau of Supplies and Accounts of the Navy, Commanding General, Air Materiel Command of the Air Force, and The Quartermaster General of the Marine Corps. The chairmanship of this board of directors is set up to rotate annually, the present incumbent being Brigadier General R. P. Hollis, USA.

Then there is the Agency Staff headed by an Army Chief of Agency Staff, an Air Force Deputy Chief of Agency Staff, and a Marine Corps Assistant to the Chief of Agency Staff. The Agency Staff is made up of an Advisory Board, a Legal Office, a Planning and Budget Office, a Public Information Office, a Purchasing Division, a Services Division, and various supporting units, sections, and branches.

It may sound formidable, but how else would you handle 15,000 different companies, bidding on everything from vest armor for troops to girdles for WACS? It goes without saying that the detailing must be perfect. All procurements are governed by the basic policies and procedures of the Armed Services Procurement Regulations.

What is this vast organization thinking of? We quote Brigadier General Hollis: "Maximum efficiency at minimum cost to the Government; a unified approach to the complex problems; reduced overall operating costs; lower prices; standardization of procedures, methods, and specifications; timing and spacing of all procurements to the mutual advantage of both Government and industry."

Fabrics on Industry's Want List

"Show us an improved fabric, and we'll make an improved product out of it — or with it." AMERICAN FABRICS *has heard that from one manufacturer after another. No wonder. There is a constant pressure to make all kinds of products smarter or safer or longer lasting or easier to clean or more economical. Sometimes an improvement in manufacturing methods will do the trick; sometimes improved materials are the answer. Frequently the solution of the problem lies in the development of a new fiber or fabric or finish with new qualities and performance-characteristics. The opportunities for textile development are many and varied. The fabric requirements of 12 typical manufacturers listed here are only a random selection. There are hundreds more where these came from. Any way you look at it the production of fabrics for industry constitutes our most wide-open fabric frontier.*

From a prominent silverware company:

"The silverware manufacturer is undoubtedly not a major user of textiles, but he is a continuous user. Since his interest is mainly in the sale of silver he has to rely on the textile manufacturer for creative ideas in that field. We are still using the same types of lining we used a hundred years ago. It certainly seems as though a strong improvement could be made."

From one of the national airlines:

"A washable, flame-resistant fabric with the drape and workable qualities of wool and the durability of plastic . . . lightweight for aircraft."

From a prominent bookbinding company:

"An inexpensive book cloth to match the paper products now being used. The high cost of book manufacturing has led to an attempt to cut costs where possible; consequently the use of paper substitutes where cloth was used previously."

From a manufacturer of ink ribbons for business machines:

"Primary requirements are that the fabrics be strong enough to resist the cutting of type faces; thin enough to produce sharp, clear copies; absorbent enough to retain and permit the free flow of the ink with which the fabric is impregnated. Areas for possible improvement in fabrics are now probably toward a stronger cloth that will not cut, yet which will carry more ink and consequently last longer under the rapid heavy usage of modern high-speed office printing mechanisms."

From a manufacturer of drapery, upholstery and curtain goods for cruise ships:

"A flame-resistant fabric for upholstery and draperies which doesn't necessitate chemical treatment to make it flame-proof and thus destroy the intensity and/or quality of the colors."

From a manufacturer of surgical and adhesive plaster and industrial tape:

"We need a better quality 80 x 80 with less neps and a finer hand, more tensile strength and less pull-down when going through the calender."

From a manufacturer of V-belts and rubber goods for the automotive industry:

"*A.* An electrical conducting, highly abrasion-resistant, heat-resistant chafer fabric. *B.* A low cost, high break strength cord better than rayon. *C.* A fabric which has either an innate ability to bond with rubber or a fabric treated at very low cost which enhances the bond to rubber."

From a manufacturer of industrial hose and belting:

"A mill process rayon and nylon fabric that can be used with rubber without further special treatment for adhesion."

From a watch manufacturer:

"Fabric with a minimum of lint to prevent interference with watch parts, and resistant to heat and sun fading."

From a manufacturer of sleep equipment:

"Would like to see better quality control at the mill level, especially with some of the *dyed in the wool* cotton mills."

From a large shoe manufacturer:

"*1.* Replacement of rayon faille now used for linings. *2.* Perspiration-resistant and mildew-resistant linings, lightweight for men's shoes."

From a laundry and linen supply house:

"Our materials are generally used under extreme conditions of heat and moisture during process of linens on presses and flatwork ironers which rapidly break them down. We would be interested in the development of any type of fabric that would stand up under these conditions."

What's On The Hotel P.A.'s Mind?

"I can't afford to guess, I've got to know." That's the angle of the purchasing agent for the modern hostelry. A bad buy can put you out of business.

You get the idea when you realize that every year our sundry, assorted caravansaries consume 14 million towels, 6 million sheets, and 5 million pillow slips. On a typical day, 4 million towels and 2 million sheets go to the laundry. Put that in your tub and suds it!

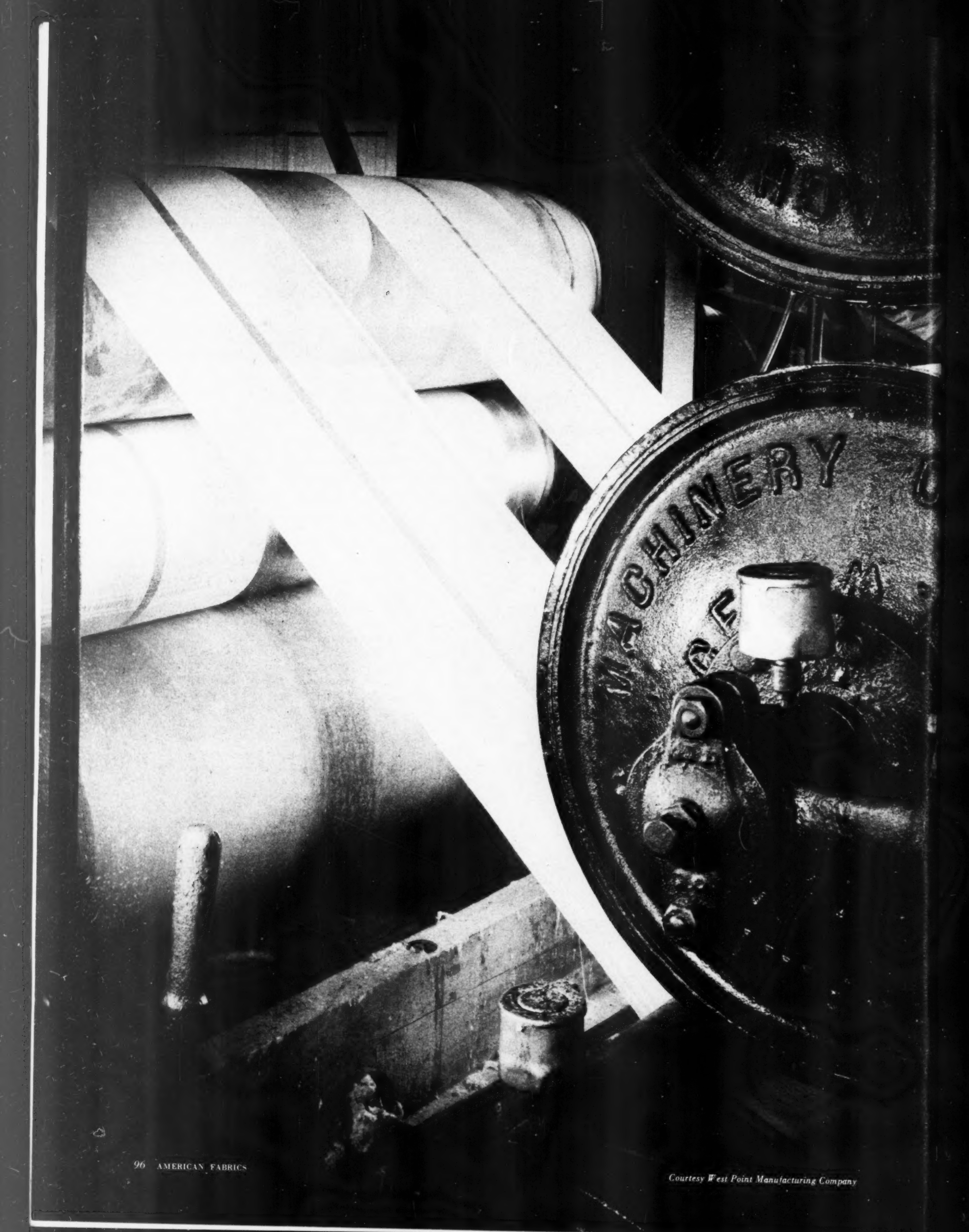
So what's on the P.A.'s mind? Permit us to quote from an authority:

"At present institutional buyers find it difficult to know what service they can expect from the fabrics they buy. Upholstery fabrics that would give long service in an inside hotel room may fade badly when exposed to the sun by an outside window. Blankets that are strong and resist tearing when pulled one way sometimes tear easily when pulled the other way. Uniforms may shrink or fade when laundered."

In other words, standards are needed to define the performance characteristics of fabrics. These standards should define such qualities as tensile strength, colorfastness, washability. After performance standards have been set up, test methods are needed by the research laboratory which tests products and equipment purchased by the 6,000 members of the Hotel Association.

The P.A. also is beginning to wonder about the wonder fibers. He knows nylon uniforms and also curtains. What next?

P.S. He would like more complete instructions about washing and/or dry cleaning the fabrics he purchases.



Courtesy West Point Manufacturing Company

INDUSTRIAL TEXTILES . . . A FIELD OF UNLIMITED PROBLEMS

The production engineer is continually confronted with critical problems. Often they are concerned with textiles used in the fulfillment of production schedules not only at the home factory but often in remote and inaccessible places. For the engineer a failure in fabric can prove to be a major crisis.

The Editors take pleasure in acknowledging the cooperation of the Wellington Sears Company in connection with the preparation of this article. The photograph below was taken in the laboratory of West Point Manufacturing Company.

ONE MARCH DAY in a western Canadian province, a little group of chemical engineers stood watching, with evident disfavor, a bulky mechanism which to anyone else might have seemed impressive. A huge cylindrical affair some twelve feet in diameter and length, it was technically known as a rotary drum-type filter. It was designed for filtering phosphoric acid solution derived from phosphate rock and was intended to revolve at steady speed. But now it was standing idle because a filter cloth, attached at fourteen-inch intervals to the drum interior, had again failed, necessitating a lengthy process of removal and replacement.

Such failures, which may chronically wreck production schedules, are a serious problem for engineers in many parts of the world. And the case quoted is typical of a thousand problems concerning all types of industrial textiles, each of which can be serious to those directly involved.

How are such problems met and solved?

The answer lies in the whole field of textile development; but, to form a clear understanding of this subject it may be well, first, to consider the differences between two essential segments of the textile industry — one comprising the apparel, decorative and household fields, and the other supplying fabrics for industry.

In the case of the first, certain fabric attributes are paramount, such as appearance, hand, styling, and novelty, combined with wear, color fastness, and other utilitarian qualities. Mills must be geared for volume production of selected styles to fit specified lines and price brackets. Marketing requires keen sensitiveness to the prevailing style and market trends; awareness of cost and price factors; originality and creative ability; imaginative appreciation of sales promotion techniques in the domestic and fashion fields and many other considerations.

In the case of industrial textiles, quite other factors are involved. Important are fabric properties which include breaking and tear strength; weight and bulk factors; tenacity or elasticity; porosity and permeability; resistance to abrasion and wear, to heat and chemicals; economy and stability of cost — to mention only a few. The mills require high diversification of facilities for production, research and development on a continuous and economical basis. Marketing involves technical and engineering experience in order to serve engineering-minded customers, and extensive cooperation and service.

A Typical Problem

The significance of these factors may be realized in examining a typical industrial textile problem, such as the one described above. In the case mentioned, the Canadian chemical engineers asked for expert help in their filter cloth dilemma. Investigation by industrial textile specialists revealed the difficulty of the operating conditions — processing a 40% phosphoric acid solution at 80°C. But a routine request for a sample of the filter cloth for test purposes produced a curious difficulty. It was too dangerous to ship. The filter cloth was of cotton, the most widely used industrial fiber, giving excellent service in almost all types of application. To withstand the effects of hot acids in this operation, however, the cotton fabrics had to be chemically treated with nitric acid. This nitrated cotton fabric was safe when wet, but, if allowed to dry, it had the explosive qualities of gun-cotton. It was, therefore, decided to mail a sample of untreated cloth, which would be adequate for laboratory porosity tests.

After making laboratory tests, the textile producers sent a suc-

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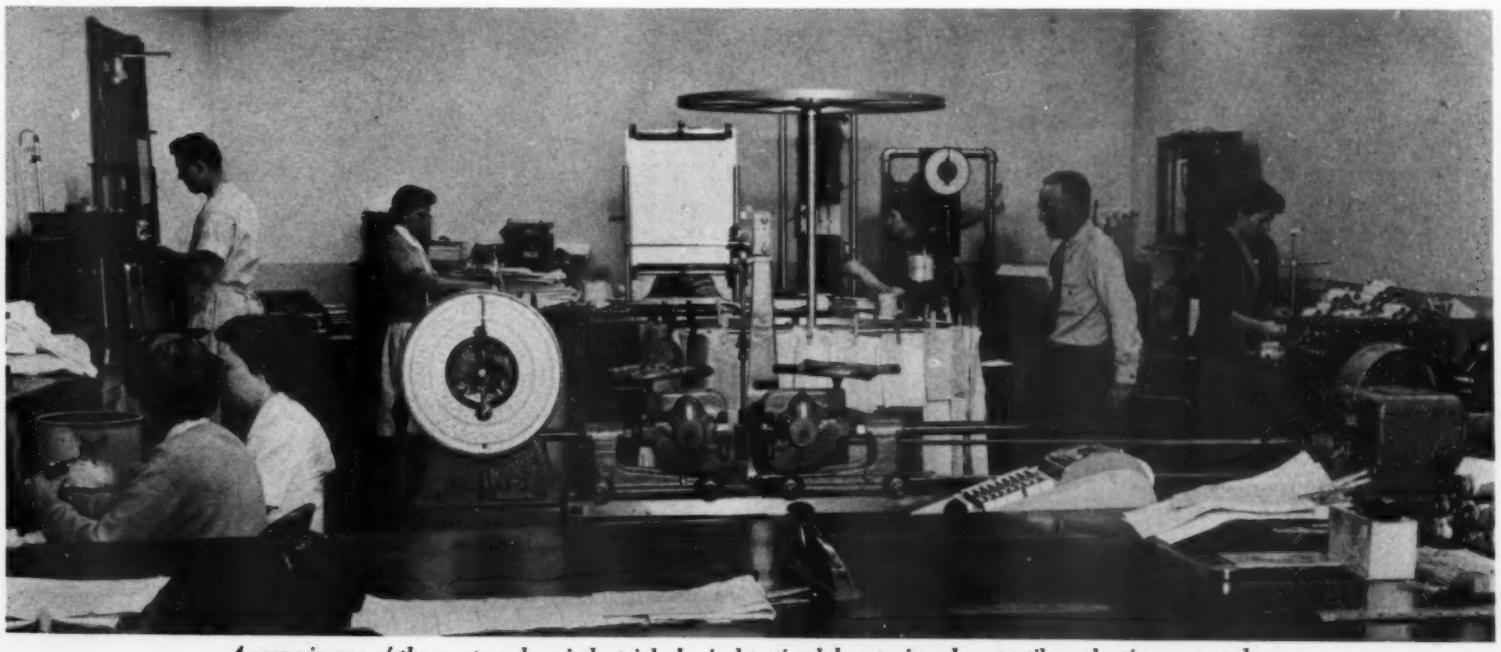


A scene in one of the most modern industrial physical testing laboratories where textile evaluations are made.

cession of experimental samples, of approximately equivalent construction but made of an acid-resistant vinyl fiber, for working tests at the Canadian plant. After long experimentation, involving further laboratory tests and practical evaluation on a trial and error basis, a new filter-cloth was successfully developed and installed. After filtering the phosphoric acid recovered from over 8,000 tons of phosphate rock, the new fabric proved to be still serviceable, whereas the original cloth had failed at 6,000 tons.

A much-needed improvement in production efficiency had been achieved. As for the textile producer, the record so far was: a full year of arduous development work, nearly a hundred letters and telegrams, innumerable small samples and specially woven and cut trial pieces (often measured in inches rather than yards), laboratory tests and consultations — with total orders amounting to less than 600 yards!

Long Term Development

Subsequently the fabric specifications were further changed; new constructions, destined for other applications in the same plant, were painstakingly developed through similar processes. Four years of patient work along these lines resulted in a typical industrial fabric development success — with an average sales volume of somewhat less than 2,000 yards annually for this particular application. To an apparel fabric producer this may sound strange and shocking, but it is by no means unexpected by the industrial textile specialist. That is the nature of the business. This development project, far from remunerative in terms of business volume from the individual customer concerned, actually proved to be a major step in extending the textile organization's capabilities in an important industrial field.

The project just described is that of an individual case. We may next consider a case history of an entire industry — the high pressure plastic laminating industry.

In high pressure laminating, fabric-based laminates are customarily produced by impregnating fabric with phenolic resin in a tank, drying it in an oven and then, in the case of laminated sheet stock, by compressing fabric layers under heat and pressure in a hydraulic press.

While several standard fabrics had been in use for this purpose for some time, an inquiry came from the laminating industry as to the possibilities of combining good electrical insulating properties with high bonding strength in fabric reinforcement. A fabric development project was initiated, and a succession of cotton, nylon, and combination fabric samples were made up and studied. Based on the results of exhaustive laboratory tests, a spun nylon fabric was eventually developed which enabled the resulting laminate to fulfill all of the desired requirements.

Other Lamination Studies

The study of this case led to further fabric development for other laminating applications involving new problems. Experiments were made with a variety of fibers and fabrics. At least a dozen different types, forms, and combinations of fibers were tried — ranging from cotton to ramie — in an effort to determine the best for each specific use. Aside from the basic fibers, numerous fabric constructions came under consideration, including the relatively novel material known as non-woven fabric; that is, a fiber mat bonded together with resin. One such non-woven fabric, because of its random-fiber construction, was found to contribute balanced, or multi-directional, strength to laminates; with the result that strength was virtually equal in all directions in the plane of the laminate, a result otherwise impossible to achieve either with woven fabrics or with non-woven materials of parallel-fiber construction. This special non-woven reinforcing material also provided the laminate with improved abrasion resistance and with excellent machining qualities, which are of particular importance in the fabrication of fine gears and of special parts such as textile bobbin heads.

Specific Properties

In high pressure laminating, it has become generally recognized that reinforcing fabrics influence vital specific properties of the finished laminate. Among these are tensile, impact, and shear strength; dimensional stability; water absorption; insulating characteristics. The individual fibers constitute the most important strength element; and soft, porous spun yarns have proved to be the easiest to impregnate with resin. While macerated fibers, yarns, or cloth fragments are sometimes used, introduction of fibers into laminates in the form of actual complete fabric, woven or non-woven, not only contributes highly uniform fiber distribution, but also facilitates handling by continuous methods in the laminating process.

Facts about the fabrics themselves have also been uncovered

Printing a design on oilcloth, one of the heaviest coated fabrics.

Arranging a jigsaw layout for cutting out industrial upholstery.

by this development program. It has been learned, for instance, that fabrics woven from softly twisted spun yarns with a distinct pebble surface have an interlocking, clinging effect between layers, which makes for high bonding strength and prevents delaminating. While balanced cloth constructions are generally most useful, it is recognized that uni-directional fabrics have certain applications of their own and may also be cross-laminated.

An example of highly specialized requirements in laminates may be found in military high-frequency electronic equipment. Besides insulating properties, this type of laminate must have good mechanical strength and resistance to heat, humidity, and tropical fungus attack. In developing reinforcing fabrics for this special purpose, it was necessary to test each of the resulting laminates for arc resistance, chemical stability, creep and cold flow, insulation recovery time, and resistance to fungus growth.

A Spun Nylon Fabric

In this case a spun nylon fabric was finally found to be the best for the purpose. While the requirements here were highly specialized, it must still be remembered that fabric development is governed by the end-use conditions of the laminate. It should be realized that this principle holds true in all industrial textile applications, whether it be the heaviest type of conveyor belt reinforcement, or the lightest, finest balloon cloth.

A multitude of industries have fabric problems; and, in each case, the particular problem assumes major proportions in the eyes of the two specialists involved: the fabric user and the industrial textile specialist.

* * *

What, then, are the general conclusions to be drawn from an examination of industrial textile development?

In the first place, it is evident that specialized methods are required to solve the specialized problems of the industrial field — problems not encountered by the typical producer of apparel fabrics. For an organization geared entirely to production of large volume constructions for the apparel market, it is not easy to commit itself to many small-scale development projects, particularly if they involve special short warps, which can be very troublesome to mill operators. To a cost-conscious mill, too, a long period of fabric development is unattractive. Even after an industrial fabric has been successfully developed, there is not always the certainty of a big volume run; nor is there an opportunity for achieving a quick, well-timed fabric success, since industrial fabrics prove themselves over years — not weeks or days.

It has happened, however, that producers of apparel-type fabrics have sometimes been drawn into the industrial textile field, particularly during years of shortage when almost any kind of fabric was in great demand. Fabrics taken directly from the looms of such producers were bought in small quantities by industrial users. Since the fabrics were not designed for the end-use, they often failed to fulfill the industrial requirement.

It may be concluded, perhaps, that industrial textile development is and must be a job for the specialist.

Tasks of the Specialist

To function successfully, such a specialist must measure up to a number of requirements. First, and most important, is diversification of mill facilities: ability to handle all types of fiber, yarn, and fabric, whether they be staple, filament, or combinations; ability to weave the heaviest fabrics, with equipment to twist plied and cabled yarns; and even the capacity to produce such specialties as non-woven fabrics. Complete research and laboratory facilities, of course, are essential.

There must also be complete willingness and cooperation in the matter of small-lot experimentation and fabric development, with a definite determination to assure continuity of supply.

A nation-wide sales force is essential, with experience and knowledge of all types of industry served; and backing up the sales staff, engineers and technicians must be available for field work. Without such a qualified technical staff, accumulated specialized experience, and sufficiently diversified mill facilities, it would be impossible to succeed as an industrial textile producer. In the case of those recognized as specialists in the field, it has taken a great number of years to build these qualifications.

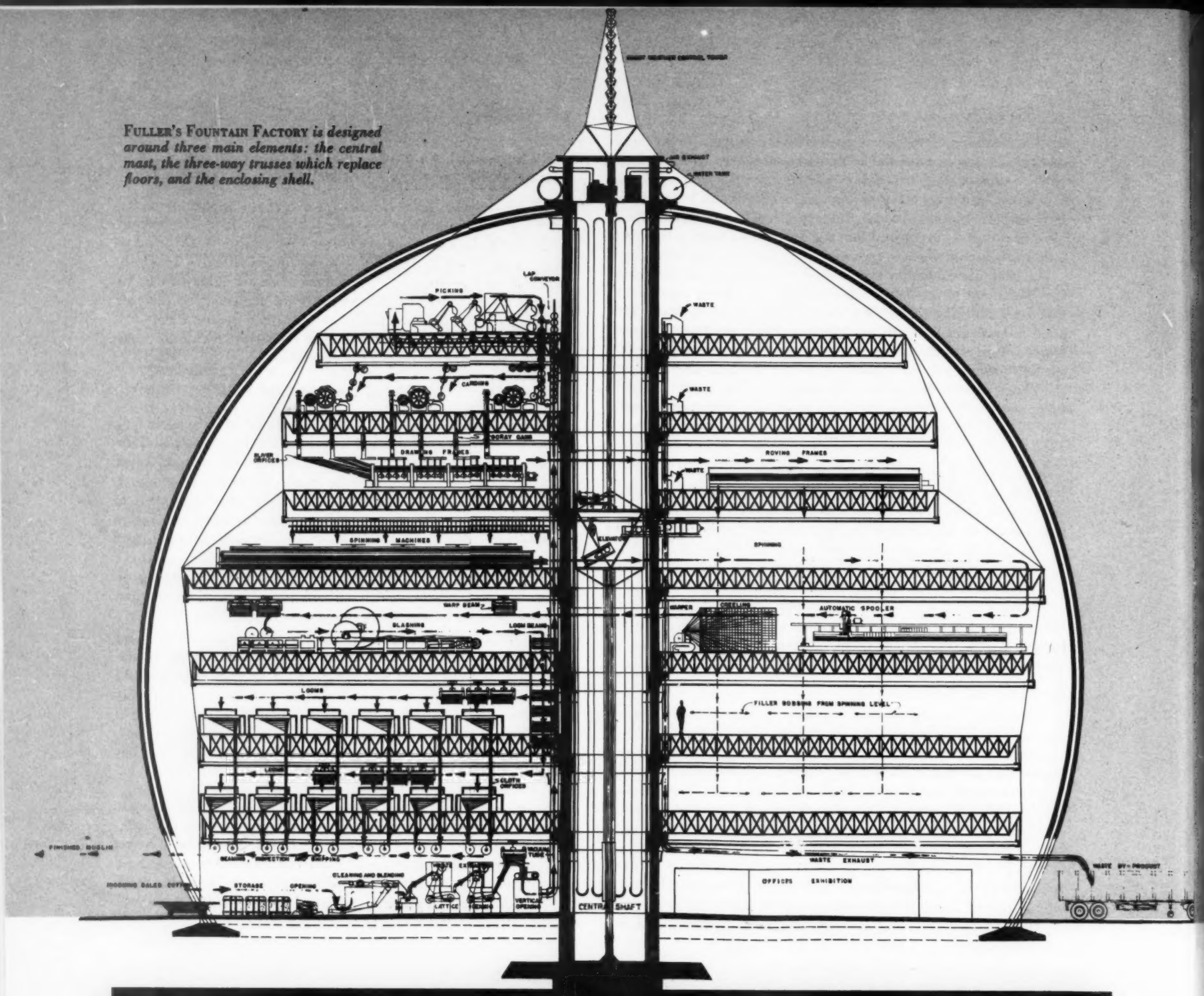
* * *

On this subject may be quoted a remark made recently by an able and successful producer of apparel fabrics. After reading a description of the industrial textile field, he said: "I used to think my business was complicated — until I found out about yours!"

END

Balloon cloth coated with rubber is used for making inflatable rafts.

Tent and awning fabrics are a major item in industrial cotton uses.



FULLER'S FOUNTAIN FACTORY *is designed around three main elements: the central mast, the three-way trusses which replace floors, and the enclosing shell.*

Textile Mill of Tomorrow

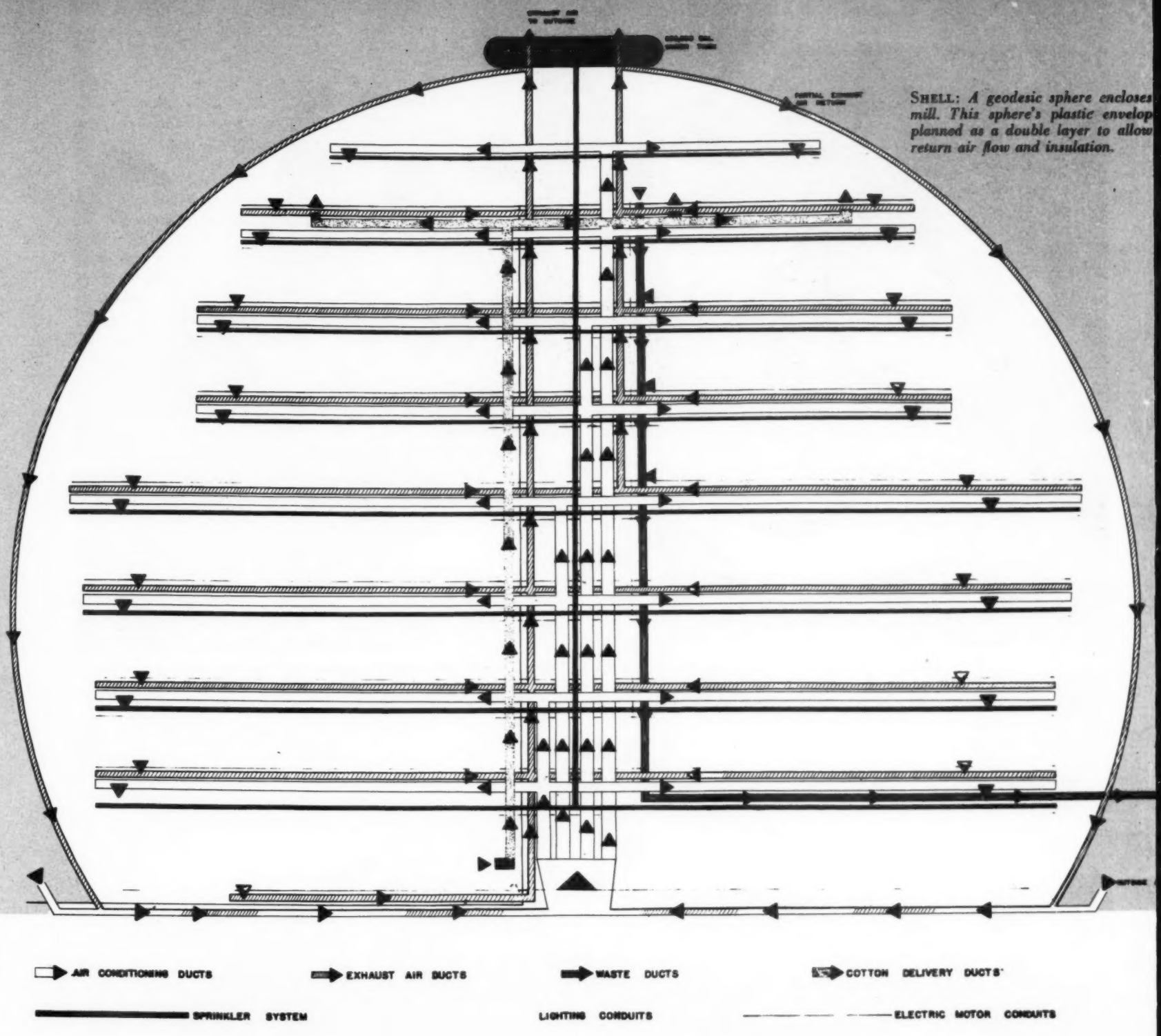
BY R. BUCKMINSTER FULLER

MANUFACTURE OF COTTON goods is one of the oldest of industrial enterprises. Its mechanical evolution initiated much of the general scheme of specialized and integrated functioning in industry. A comprehensive resurvey of cotton manufacturing evolution from our now great *hindsight* advantage, reveals patterns involving what were originally basic assumptions, and which — although no longer basic — still pace the progress of the industry.

These basic assumptions became obvious, and then too obvious, and were lost sight of in the accelerating sequence of secondary consequences. Nonetheless, many of the original factors, no longer valid, underlie the mutations of the original integration.

The industry's first obvious assumption was that cotton mills must be installed beside mill dams — because cotton machinery would *always* be powered by water wheels, requiring translations of power by belting pulleys and meticulous paralleling of shafting in the most geometrically economical patterns, consistent with all the functions of picking, carding, combing, twining, spinning, and weaving. Obviously logical for the preservation of the expensive machinery was its housing: One hundred per cent compressively-conceived stone masonry for vertical components, and heavily sectioned wooden platforms for horizontal components. The natural clustering of the necessary mechanical stages called for a geometry of four or five tiers of flooring.

Bigger and better machinery quickly evolved. Weights went up. It became necessary to invest precious iron in stanchions to shore up the overloaded floors and replace rotting wooden verticals. Again, overloadings and high-tiered flooring eventually created wall bulges and failures when buildings lacking tensive



SHELL: *A geodesic sphere encloses mill. This sphere's plastic envelop planned as a double layer to allow return air flow and insulation.*

cohesiveness began to settle. More precious iron went into the installation of the first structural components to be introduced into buildings — cross tie rods between outer walls.

Coming of Electricity

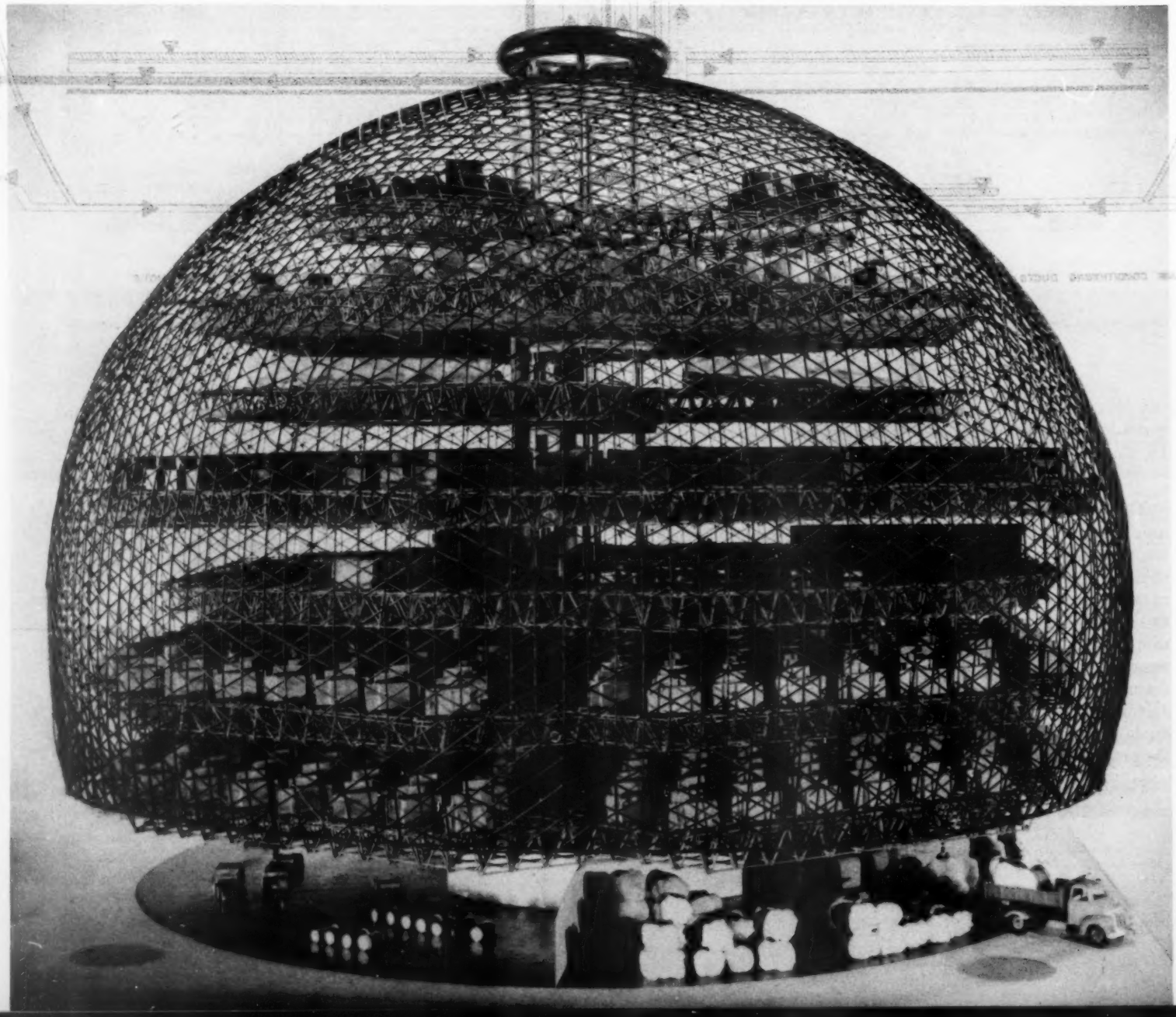
The coming of electric motors, three centuries later, developed unit machine autonomy and created a partial revolution in cotton mill design. No longer limited by the economics of pulley shafting, mills tended to fan out machinery on one-storey concrete floors, as in the large automobile production plants. But this revolution was also predicated upon the piecemeal and intermittent set of events constituting the history of the manufacturing equipment. Originally this was heavy, and even more heavily framed, chiefly because of the necessity of maintaining precise alignment of the large machines with the pulley shafting, and enabling the equipment to maintain functional integrity despite the progressive sagging of the wood floors.

The whole early concept of factories assumed flooring requirements of 200 lbs. to the square foot over all areas because the particular areas eventually to be employed could not be anticipated. The revolution of new cotton mill design, characterizing the switch from New England to the Southern States for economic reasons, occurred after electric motors were introduced and steel structuring was available, and was made possible by air conditioning and large spans of steel trusses, etc. However, the one floor scheme exposed large roof areas to the sun. There was a consequent lack of energy efficiency in providing desirable air conditioning. Further, the machinery itself, though now installed on one floor, represented widely separated operations. The cotton itself, in various stages of process, had to be transported in batches on various types of reels and in special containers, and was progressively introduced into the processing machines. The basic floor design persisted, assuming potential machine load installations on every square foot of floor area.

That little gain has been made in the numbers of automatic functions is the result of the primary building designs themselves. Because of the enormous foundation layout, and the assumption of *anywhere-everywhere* loading, the cost of buildings and,

(please turn)

Fuller foresees lightning-like expansion possibilities for his fountain factory — with a bigger geodesic dome erected over the existing one, the older sphere quickly dismantled, truss levels extended, and more machinery installed with no stop in work. Below is shown a scale model of the geodesic shell. Above: Students studying models of structural elements.



along with it, their maintenance cost, have continuously risen.

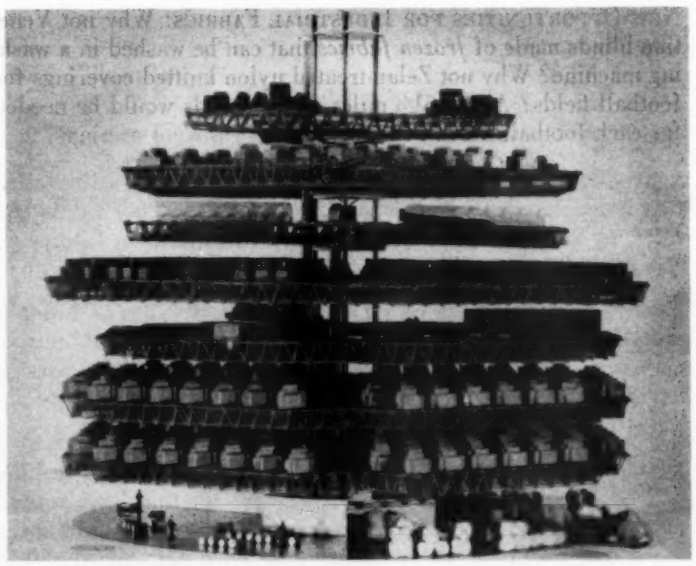
Two industries with more recent starts than that of cotton manufacture, and therefore with less accumulated tradition of conceptioning and operating strategy, have shown far greater susceptibility to scientific treatment and therefore to acceleration in evolution of both general and particular physical mutations. These are the chemical manufacturing and electrical power generating and distributing industries. As a consequence, these have demonstrated, in recent years, economy and profit of greater scalar magnitude than the cotton processing industry.

The chemical manufacturing industry soon took scaling ladder advantage of its advancing knowledge of natural association-dissociation principles by developing non-deteriorating all-weather and continuously-operating machinery. Like a chicken, it burst out of its classical corniced brick egg to stretch out nakedly and majestically with its omni-directional system of receiving, self-metering, fractionating, accumulating, regeneratively circuiting, and distributing facilities.

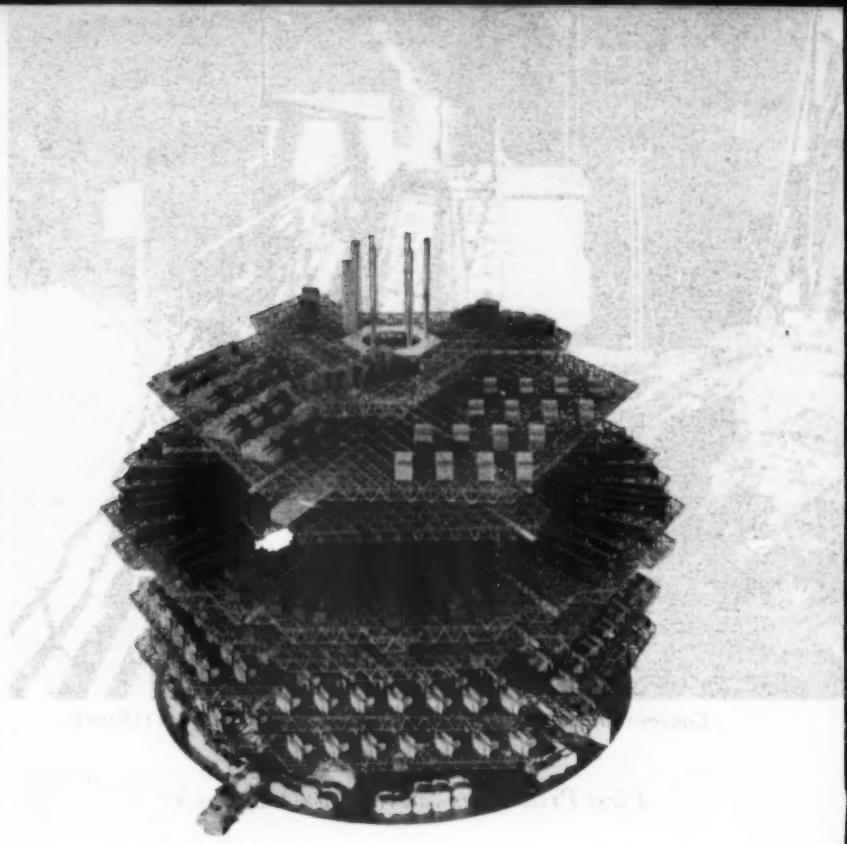
Synchronization Trends

The relatively new electrical-generating industry and its distribution system (and its by-product coke and coke-derivative chemical processing) have been repeating the out-of-egg process and are now better than half emerged. The transformers and other major pieces of equipment are now in open air switchyards. (In partial fulfillment of this emergent-trend principle, man has ventured forth from his fixed housing in the automobile — which is a type of all-weather, multi-person clothing, enclosing sofas with wheel supports and integral motors — to sit comfortably outdoors at open-air movie theatres.)

The cotton mill might seem to possess inherent and insurmountable obstacles prohibiting synchronization with these dynamic trends — such, for example, as the natural structure and behavior of cotton which, unlike liquids and electrons, would seem to prohibit pipable, wirable, flow treatment. But this is not true. Approximately a half century ago cotton was first vacuumed out of its freight cars and blown 60 feet to the top floor picker-room of cotton mills.



TRUSS-FLOORS: *Fuller's basic structural innovation is the steel trusswork used, like a scaffolding, to support the machinery in proper position in the vertical process flow. These truss-floors are designed on a three-way triangulated system, which has the big advantage of distributing stresses in concentric circles.*



MAST: *Fuller hangs his truss-floors from a mast. This central support is made of six concrete spiral reinforced columns 18" in diameter placed 10 feet apart in a hexagonal pattern, and designed to carry a total load of 3,200,000 lbs. These columns are braced by reinforced concrete rings at floor levels, at 14-foot intervals.*

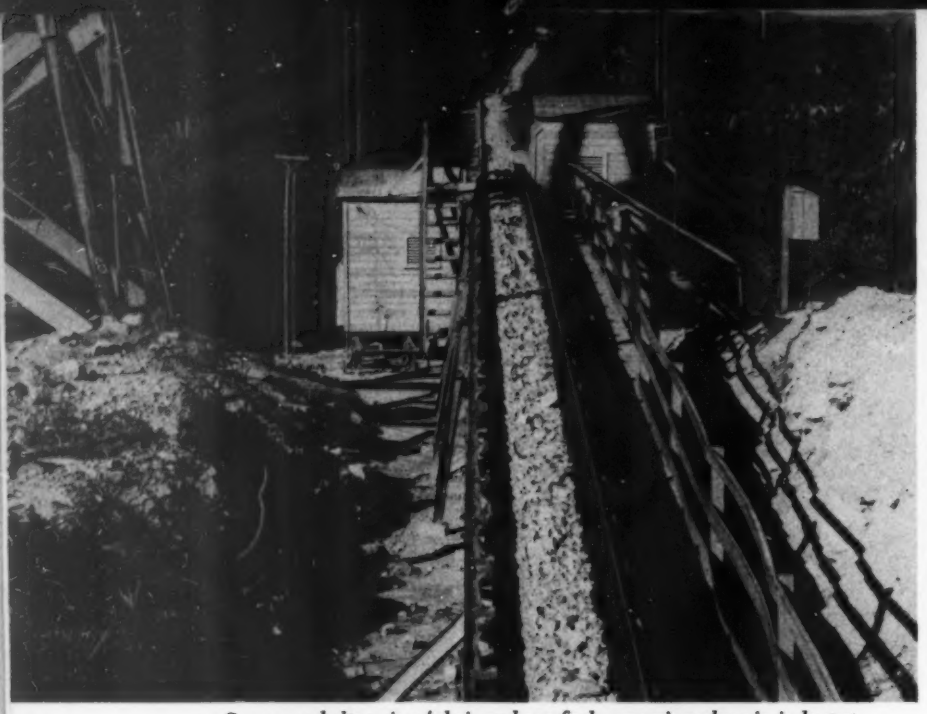
A totally new start in cotton mill conception is now proposed, in which only the essential articulating and reciprocating mechanical components of the various stages of manufacture are separated from their obsolete, separate chassis.

Establishing the Flow

It is proposed that a unitary, three-quarter spherical, air- conditioned enclosure be provided, with a secondary three- quarter sphere interior geodesic structuring entirely independent of the enclosing structure. The latter will serve only to support the articulating mechanisms — which can be suspended within. Thus a true flow process can be established, similar to the digestive, shunting, secretive, and regenerative process of the human anatomy. This literally will digest and process the cotton, taking advantage of ample height and gravity to drop-lead, space-accumulate, and meter the progressive bats, slivers, and threads, and thus eliminate the primary re-introduction chores of workers, and the enormous and heavy floors around which roll the relatively light loads.

The savings in amounts of metal required permanently to truss-sling the apparatus into the preferred flow patterning positions will be of dramatically significant magnitudes. The free space positioning of the apparatus will be such as to permit its interpenetration by swiftly conveyed mobile staging, and to bring the few expert attendants into intimate advantage relative to any stoppage in the automatic processing.

The whole process may be kept in constant review from central space advantage. The preferred aerodynamics of the three-quarter sphere, in its economy of laminar circulation, will provide highly efficient air conditioning and illumination, and require a minimum of concentrated foundation to support the base of the geodesic structuring. **END**



Conveyor belts using fabric as base find a growing place in industry.

First Principles . . . *continued from page 87*

of schools and colleges, residential suburbs, and vacation spots.

Those who enjoy hair splitting can have a fine time. Again the Department of Commerce comes through with a shining example in listing lace as an industrial fabric in the manufacture of dolls. It is an industrial use all right, but just what are we trying to prove? Or how doctrinaire can one be?

There are far more troublesome over-lapping classifications. Should the cloth used for basketball and football pants be called a work clothing fabric because it is a kind of uniform fabric? Probably. It seems to belong to the same breed. Certainly it is made and bought and sold in the same way. On the other hand, such an item as tennis shorts, which may also be worn as walking shorts, seems to belong in sportswear. Be it noted that athletic goods retailers carry both uniforms and sportswear, with some of the larger ones adding general lines of men's clothing and furnishings specifically styled for sporting tastes.

A strong protest is registered against the practice, all too common, of putting down curtains, drapes, and rugs, on the industrial roster. If so, what next? Why not sheets and towels? Or baby's diapers? Again it is suggested that the actual usage of these words by well informed people should be the determining consideration, just as *reputable usage* in actual practice governs the definitions of the dictionary.

Furthermore, no useful purpose is served by enthusiasts who would include under the heading of industrial fabrics practically everything that is not nailed down. People will go right on thinking of curtains and drapes as household fabrics. Mills and converters will go right on making them for the home furnishings trade; department store buyers will keep on placing their orders in line with standard retail procedure and not according to the general procurement practices of purchasing agents for industrial concerns.

The purchasing agent gets into the picture when his plant requires a special floor covering for production purposes. If that floor covering contains fabric, then it is an industrial fabric; but the rug on your living room floor is about as industrial as the handkerchief in your pocket. With all these new fibers and finishes coming in, the field of authentic industrial fabrics is going to be so vast that no one interested in it need ever go outside his own bailiwick to make a brave showing.

Let us therefore think of the fabric world as divided into three parts; the first has to do with apparel, the second with household, the third with industry in all its ramifications. That means agriculture, shipping, mining, transportation, and so on, right down the list.

Then you will inevitably think of industrial fabric the way you think of iron, rubber, chemicals, woods, and other materials. You will define industrial fabrics as those used in a product or to make a product; not forgetting the cloth needed for covering, transportation, and storage. You will include fabrics for individual workers as well as all uniformed workers, whether they are in the service of an institution or an industrial enterprise, the civil government or our military establishment.

* * *

Now let us probe a little deeper. There is another definition of industrial fabrics that goes beyond words, however carefully chosen. It is a definition based on the way these fabrics are made and bought and used. With such an end in view, you might designate them as *specification fabrics*, because that is the way they are bought. In fact, *procure* is perhaps a better word in this connection than *buy*.

Furthermore, the procurement of industrial fabrics is for production projects and production workers. The customer is not an individual, but generally a corporation, or an institution, or a department of government. Instead of the housewife who does the buying we have the purchasing agent, and back of him the engineer who writes the specifications. Think of industrial fabrics as one of the basic ingredients *of* which and *with* which American products are made, and you won't go far wrong. ***END***

Thumbnail Prospectus . . . *continued from page 87*

AGRICULTURAL FABRICS: Coverings for crops, such as tobacco; baggings and container fabrics; protective fabrics and meat industry cloths; dairy industry cloths; conveyor fabrics used in agricultural machinery; webbings.

NEW INDUSTRIAL USES: Old fabrics used in new ways; new processes for old fabrics; new blends and combinations for new uses. Every important segment of industry is being covered by textile manufacturers in an effort to develop the best service and price through the industry to the consumer.

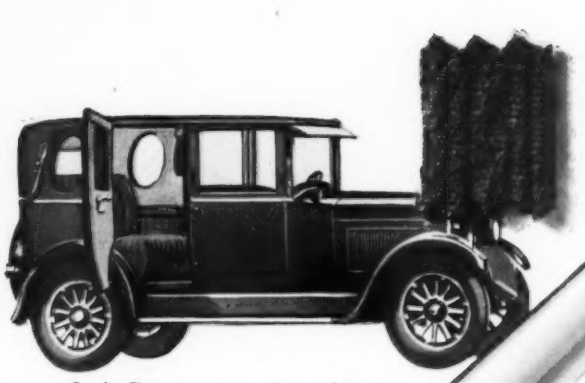
NEW OPPORTUNITIES FOR INDUSTRIAL FABRICS: Why not Venetian blinds made of *frozen fabrics* that can be washed in a washing machine? Why not Zelan-treated nylon knitted coverings for football fields? About 5½ miles of 36″ goods would be needed for each football field. Why not weather-resistant awnings?

LITTLE-KNOWN FACTS ABOUT FABRICS: Interesting information that has been overlooked; specialties; fabrics whose use is isolated or limited; special terms used in regard to fabrics of special industries.

THE PURCHASING AGENT'S POINT OF VIEW: His special outlook; special fabric, service, and development needs. Particular specifications and special tests required for such industrial uses as demand high strength, abrasion-resistance, durability of special kinds and other specific properties.

INTERCHANGE OF IDEAS: Special emphasis on forward-looking and challenging subjects. Encouragement for the fabrics engineer and designer who look beyond the present. A chance for the textile expert to air his views and get a fair hearing. The value of the textile technologist and his knowledge and experience in regard to fabrics used by industry.

HISTORICAL PERSPECTIVE: *Profiles* of outstanding industrial fabrics, sketching their development so that the experience of the past will not be lost to the thinking of the present. Plans for the future likewise envisaged.



In the Twenties—any color, as long as it was drab.

Color—that's what makes fine cars today a delight to the eye and a tribute to the careful planning of the men who make them. As in the model illustrated here, the entire color scheme stems from the two-tone body. Inside, the upholstery... the carpeting... and every visible metal part are meticulously co-ordinated with the exterior colors.

COLOR SCHEME for selling a fine car

Keeping in step with its customers—and offering them only the best that can be made—have marked Chatham's history from a small family business to one of America's great mills. This way of doing things began with the founder seventy-five years ago, and continues today as a matter of family pride with the fourth generation of Chatham sons.

And family pride is a very good guarantee of quality.

CHATHAM upholstery

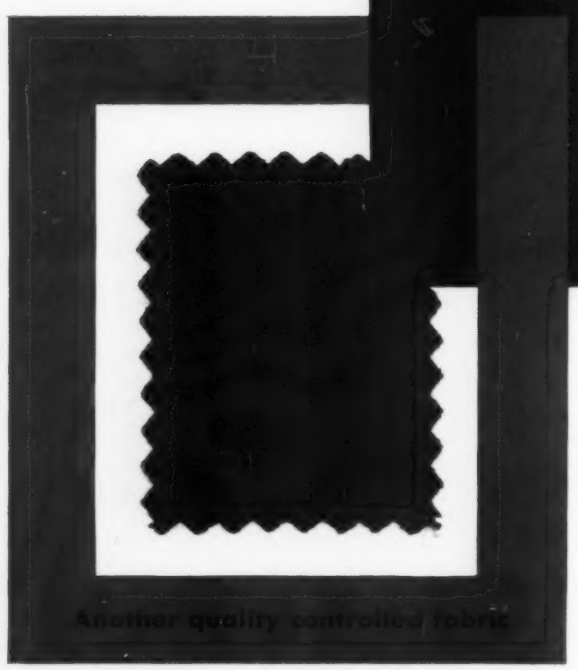
This is one of the handsome new patterns in Chatham's Bedford Cord, color-engineered to harmonize with the bolster fabric and with the tones of the car shown above. Chatham's rugged nylon upholstery, wool and nylon mixtures and woolen broadcloths are equally beautiful proof that *color* sells cars today.

Chatham Manufacturing Company, Elkin, North Carolina • Automotive Fabrics Representative: Getsinger-Fox Company, Detroit

a successful
Glen Raven fabric
inspires a

new
texture

tweedy bouclé



Glen Raven
"Fashion Right"

A crease-resistant boucle with a fashion-knowing texture headed for even greater success than our best-selling boucle. Developed and woven by Glen Raven Mills of 100% pure Viscose, it dramatizes the soft hand and true color of acetate . . . making it the perfect medium for all fashions including suitings.

GLEN RAVEN MILLS, 265 MADISON AVENUE, NEW YORK 16, N. Y.

AMERICAN FABRICS TEXTILE QUIZ

On each line of the quiz below one of the four terms does not belong with the other three. Check the term that you think is incorrectly included in each case and refer to the section below for the answers and proper explanations. Score 4 points in the left-hand space for each word that you correctly check. 64 passes; 74 is fair; 84 is excellent.

*1.*_____	Oxford	Poplin	Madras	Shantung
*2.*_____	Bengaline	Grosgrain	Ottoman	Taffeta
*3.*_____	Seersucker	Crepe	Hopsacking	Dimity
*4.*_____	Donegal	Cassimere	English	Cheviot
*5.*_____	Melton	Gun Club	Shepherd	Houndstooth
*6.*_____	Plissé	Eponge	Blister	Seersucker
*7.*_____	Sarelon	Vicara	Perlon	Lanital
*8.*_____	Faille	Luana	Denim	Fuji
*9.*_____	Marquisette	Buckram	Tarlatan	Crinoline
*10.*_____	Voile	Rep	Poplin	Broadcloth
*11.*_____	Honan	Marocain	Nankeen	Shantung
*12.*_____	Velvet	Corduroy	Jacquard	Velveteen
*13.*_____	Surah	Whipcord	Tricotine	Tackle twill
*14.*_____	Gamza	Ninon	Taffeta	Romaine
*15.*_____	Moiré	Rhythm	Rough	Flat
*16.*_____	Calico	Chintz	Cretonne	Osnaburg
*17.*_____	Drill	Duck	Canvas	Frisé
*18.*_____	Friezette	Box	Balanced	Matelassé
*19.*_____	Dimity	Huckaback	Damask	Fisheye
*20.*_____	Madras	Piqué	Bunting	Bedford cord
*21.*_____	Duvetyn	Montagnac	Challis	Flannel
*22.*_____	Pin-check	Frenchback	Birdseye	Tack-head
*23.*_____	Cambric	Longcloth	Lawn	Organdy
*24.*_____	Canton	Baronet	Crepe-back	Rib-back
*25.*_____	Monotone	Scotch	Linton	Velour

Identification of Quiz Words

1. Madras is a warp-striped shirting fabric; others are known for their bulky or rounded filling yarn effect in the goods. *2. Taffeta* has a fine line effect caused by filling yarn; others are easily recognized by their pronounced crosswise effect in the goods made by heavy filling yarn. *3. Hopsacking* is a basket weave material; the others are made in variations of the plain weave. *4. Cassimere* is a worsted fabric; the others may be classed as tweeds. *5. Melton* is a heavy overcoating material; the others are identified by the check effect in the weave. *6. Eponge* is a soft, spongy type of cloth made in a plain weave and given a low texture count; the other cloths have a raised or puffed surface effect. *7. Perlon* is the nylon of Germany; the other three are known as semi-synthetics and are made from protein of peanuts, corn (Zein), and skim milk, respectively. *8. Denim* is made with left-hand twill weave; other fabrics are identified by their characteristic cylindrical filling and plain weave. *9. Marquisette* is a lightweight cloth made with a leno or doup weave; the other materials are recognized by their stiff finish. *10. Voile* is made of plain weave, has very little finish applied, and is a limp fabric; the other three cloths are used for shirting and have compact construction, as well as cylindrical filling yarn. *11. Marocain* is a type of crepe weave fabric, rather heavy in weight; the other cloths have irregular, nubby yarn used in the construction. *12. Jacquard* is a motif, pattern, or design found in damask, brocade, brocatelle, and comparable fabrics; the other three are pile fabrics. *13. Surah* is made of a 27-degree or a 45-degree right-hand twill weave; steep twill weaves are used to make the other three fabrics. *14. Romaine* is a crepe fabric; the others are typical acetate yarn fabrics. Romaine is usually made with a combination of viscose and acetate. *15. Moiré* is the watermarked finish applied to some fabrics; the other three signify crepe weave materials. *16. Osnaburg* is the base fabric for cretonne; the other cloths are printed materials. *17. Frisé* is sometimes known as cotton frieze and is an upholstery cloth; the others are rugged cotton fabrics. *18. Friezette* is cotton cloth of lighter weight than standard frieze, and made of wool and cotton; the other terms imply crepe weave fabrics. *19. Dimity* is a cotton material; the others are standard linen cloths. *20. Bunting* is made of plain weave while the other fabrics are identified by stripes or cords that run in the warp direction of the goods. *21. Challis* is a worsted fabric devoid of nap; the others are identified by a carefully produced nap effect on the surface. *22. Frenchback* is a backed cloth with the back of the goods made of cotton warp or cotton filling; the other cloths are worsted and are identified by their small eye, pin, or birdseye effect. *23. Organdy* is known for its crisp, stiff finish; the others have much less stiffness in the finish. *24. Canton* refers to a crepe fabric; the others refer to satin fabrics. *25. Velour* is an overcoating fabric popular in the women's wear trade, and when made in check motif used for dressgoods as well as for smart coatings; the other fabrics are known as tweeds.

FABRICS BRIGHTEN TRAVEL

Our industrial civilization was built on the answers to the question "Does it work?" As the Yesses mounted in a mighty chorus, business and industry — recently, as time is counted — turned to a consideration of the questions, "How does it look?" . . . "How should it look?" . . . "Why should it look that way?"

by HOWARD KETCHAM

IN A SENSE, we are leaving one industrial era behind us and approaching another — the era of Color, Design, and Appearance. Not, of course, that form, function, dynamics, usefulness, price, and operation are no longer important. It is just that we are in the habit of licking with ease the problems they present. It is for this reason that more emphasis will be placed on color, design, and appearance. And to good effect — for that is where lies the sales stimulation of the immediate present and the near future.

What does this mean so far as transportation fabrics and color are concerned?

The most important current concept behind the interior design and decoration of any common carrier today, be it train, plane, bus, car, ship, or boat, is to approximate the comfort, the livableness, and the relaxing atmosphere of the passenger's own living room. *Human engineering, appearance engineering, comfortization* are all expressions of professional jargon meaning just this. Let's take a look, then, at what's happened to the modern living room.

Remember the Turkish corner? Remember the telephones lurking under hoopskirted dolls? Remember the beaded, bedizened lamps, the overstuffed upholstery, the plush suites, the corniced draperies on top of curtains on top of blinds, the *occasional* tables littered with bibelots, photographs, objets d'art, and with just litter, the scatter rugs on top of carpets, and the general feeling of clutter and stuff? Gone — all gone — not with the wind, but with the greater concern with space and a feeling of spaciousness, with light, air, simplicity, and opening up instead of closing in. Gone is the overstuffed, dust-catching upholstery; the walls are broken up by windows as large as possible; gone is the emphasis on decoration and embroidery; in its stead an emphasis on form, function, shape, silhouette, texture.

The new open floor plans, with one room leading inescapably into another have given rise to a new necessity for furnishings to blend, for colors to lead pleasantly into one another, for styles to go well together. In just a few years, upholstered furniture has grown legs, sprouted wheels, lost considerable bulk, become lower as well as slimmer in silhouette, cell-divided like amoebae into flexible sections, and grown much lighter. At the moment, its very cushions stand in danger of their lives, as *tight seats* grow in popularity, offering comfort, ease, and newness at a price.

All of these developments have conditioned people's taste past the point where they merely accept new ideas in design and fabrics. Today, right now, whether as home dwellers or as passen-

Howard Ketcham has had long experience in color styling in the transportation industry. He has styled $50,000,000 worth of aircraft for Pan-American World Airways. For the Long Island Railroad, the New York Central, and the Jersey Central Lines, he has modernized commuter equipment. . . . Howard Ketcham, Inc., is now working under contract with the U. S. Air Force to determine optimum lighting requirements for all military aircraft.

gers, they demand this new feeling in furnishing.

And they demand it — not vocally, but it's a demand nonetheless — in the transportation media they use. Train, plane, bus, auto, boat, what have you —the problem is the same. Each presents an interior space which is both cramped and peculiarly shaped by home standards. The problem then is how to make this cramped space appear less cramped, by the use of the proper fabrics and colors. And how to make this increased feeling of spaciousness give off a livable home-like atmosphere as well. Let's take a look at how this problem is being solved today by pace-setter carriers of all kinds.

Take planes, for example. Back in the early days of air transport it was considered adequate decoration and comfort if a plane had seats that looked like deck chairs, burlap curtains, and a coat of paint — any color. Today, the picture couldn't be more different. Decorating and furnishing big passenger planes has now become a subject for the professional designer's skill. Why? Because the passengers demand comfort and livableness. It isn't particularly easy to provide this in a plane. Take for example, the case of Pan American World Airways' giant Stratocruisers, whose interior decorating problems I was asked to work out. They looked like nothing so much as huge airborne tunnels. How to make them look less so?

Foreshortening by Color

This was my procedure: I used color to make the 66-foot upper deck of the plane appear shorter and higher, foreshortening the long row of seats on the upper deck by using one color up the middle, and another color from there to the rear of the plane. By using progressively lighter colors as the passengers' eyes travel from the deep blue of the carpet to the light-reflecting bisque overhead, an illusion of increased height was created in the cabin. In addition the forward seats were covered in blue-green and the rear seats in beige, a device that helps to break up the rigidity and circumscribed lines of the cabin space. The lower deck, ending in a sweeping curve with a horseshoe seat, was "enlarged" by the use of colors and a mirror. Horizontal curtains with an inverted V and a white stripe on the lounge seat added to the illusion of height.

In these big planes a total of 22 variations of five basic colors was used. The colors were Pan American blue, blue-green, silver-grey, bisque yellow, and magenta. I list them because good colors for planes are not necessarily good colors for other kinds of carriers. Airplane interior colors must be able to disguise stains and soil, yet not be so greyed as to be muddy. They must be rich without suffering the dispiriting effect of certain purples, and they must be keyed to the reflection of high altitude flight. Cockpit colors represent a special problem, because the black interior which would be best at night would trouble the crew against the sky-blue and cloud-white backgrounds of daytime. I therefore chose colors that would darken under the red light which is intermingled with regular white lamps in the crew cabin.

The fabrics used were foam-rubber backed carpets, and wool seat upholstery with a deep texture, in colors for proper light reflection at altitudes up to 40,000 feet. The thick carpet and heavy wool upholstery helped to reduce vibration and deaden noise. Thus, one *first principle*: choice of fabric always follows need and function.

A Change in Weight

The manufacturer commissioned with the production of these new post-war super airliners had stipulated in his agreement that seat upholstery should weigh no more than 10 ounces per square yard, and that the carpeting should not exceed 27 ounces per square yard in weight. This thinking was a carry-over from pre-war days.

I saw matters this way: Passenger aircraft was at this point destined to fly the oceans of the world. It seemed completely out of line that engineering talent was still viewing the prerogatives of post-war passenger payloads in terms of pre-war comfort and luxury limitations. There seemed no practical reason why all of the weight saving economies were being foisted on the passenger in terms of underweight furnishings. And soon it was possible to convince the airline's management that the ultimate result of emphasis on weight saving in wrong locations would be to have passengers eyeing frayed fabrics and floor coverings and gaining the undesirable psychological reaction that perhaps the airline was indulging in other economies as well as in fabric construction. It was pointed out that excessive lay-over for repairs and replacement of inadequate seat coverings would cost dearly. Also, the use of coarser pile fabric would permit air to circulate around the passenger and permit his body to *breathe,* besides helping to support his body in a more comfortable sitting position. As a result, upholstery material (*stratotweed*) weighing almost 18 ounces per square yard was introduced and is now used by most of the world's airlines.

All-wool loop-pile seat upholstery in Pan American stratocruiser permits body to breathe. Quiet color creates sense of restful and luxurious travel and harmonizes with walls and floor covering.

In the world's most modern ship, the *United States,* largest and fastest ocean liner ever to be built in this country, many thousands of yards of fabrics were needed to furnish and decorate a structure five city blocks long and twelve stories high. The problem was to do this with beauty, freshness, imagination, utility, and durability, and to do it without using anything that

(please turn)

Before: Poor lighting and old style plush seat covering of one of the old coaches operated by the Jersey Central Lines. Incidentally, the seat covering shown cost approximately twice as much as the nylon fabric which has been chosen for use in coaches today.

After: Same type coach decorated in color combination selected by preference poll of commuters. Green upholstery, tan plastic-coated window shades, and sand-colored enamel on walls and ceiling contribute to feeling of light, space, and generally pleasing atmosphere.

would be inflammable or would absorb moisture.

After much experimentation, a new synthetic linen-like fabric, woven from Dynel, was chosen for curtains and bedspreads in all staterooms except the luxury suites. All furniture is aluminum, and even the paint is fire-retarding. For public rooms and cabins, a number of the most talented American weavers contributed striking original designs for specially handwoven fabrics. These fabrics, handwoven or in some cases made with a hand-loomed quality, have a refreshing variety of texture and thread. Their nubby, thick, pleasant feel is the same as that so much used in contemporary home interiors. Metal threads woven through some of these fabrics contribute a glint of gold, silver, and copper. Solving problems of fireproofing these handsome fabrics took months of study, for fireproofing had to be effected without diminishing color, wearing quality, or ability to resist moisture.

So far as the use of color on the ship is concerned, the decorators elected to use it as a way of relating the ship to its natural elements — the sea, the wind, and the stars. This device seems to pull the whole interior scheme into a pleasing, subtle harmony. A wide range of greens and blues in many of the fabrics and some of the art, runs as a motif throughout the ship. A great variety of treatment, however, makes each room fresh and sparkling. Even off-whites used in large wall areas and fabric backgrounds vary from pinkish beige to oyster and light grey. Similarly, reds range from deep rich red through flame and brilliant coral to muted light reds. All in all, more than ninety different colors and shades have been used throughout the ship, with the accent on clean, fresh hues. They have, however, been used with such skill and artistry that a harmonious unified whole has been achieved.

All of which leads to the statement of a major first principle: The choice of color for transportation fabrics can well serve to tie the carrier in with its natural habitat; in other words to relate the carrier with its environment.

This does not exclude, of course, the provision in some cases of an effective contrast with the environment.

Another interesting solution of a carrier's color and fabric problem is that afforded by the Milwaukee Railroad's ten pace-setting, full-length new Dome-Lounge cars. These cars, providing strictly non-revenue lounge space of exceptional appeal, are the result of the Milwaukee management's determination to provide a new prestige-building and passenger appealing feature.

Their aim has been to get the cars talked about from coast to coast. They put color and materials to work to achieve this end. In the first place, the eye-catching, full-length glass dome, 15½ feet high, harmonizes with the exterior color scheme of the cars which consists of the traditional Milwaukee harvest orange and royal maroon with black underbody. Inside, in the dome section, the floor covering consists of rubber tile with an authentic Indian motif incorporated in the aisle strip.

Seats in the dome section are covered with a copper colored fabric, in a pattern that also shows Indian influence and forms the initial *M* in a running design. Armrests are covered with the same material, but the seat-ends are upholstered in stain-proof, Buffalo-grain turquoise Avtrim.

On the lower level of each car, the entire lounge floor, including passageways leading to double-acting swing doors, is covered with Wilton type carpeting in green and antique gold, original in design and again based on an Indian motif.

OLD AND NEW

In an old coach operated by the Jersey Central Lines, the deep pile upholstery tends to collect soot and is difficult to clean. Note the mutilated condition of the wood panel and the unsightly heating element. In the modernized version, note the nylon seat fabric built to today's specifications; the textured, stainless steel panel, and metal cover concealing the pipes.

Thus, in choosing furnishings for its greatest prestige building cars, Milwaukee decided to capitalize on its trademark, extending the Indian motif throughout in the fabrics and colors chosen. This is still another solid way of relating and tying in furnishings and fabrics with the goal desired — in this case, prestige-building and the promotion of company identity.

The Auto — A Room on Wheels

With automobiles, there seems to be no question about the clearness of trend in decoration. Every car interior is yearly becoming more plainly what one Ford head engineer calls *an honest-to-goodness room on wheels*. Although only within the past few decades have manufacturers begun to try to make automobile interiors pleasing to the eye, progress has been so swift that today every manufacturer is trying to put as much character into his room as he can. And we are beginning to see fewer mistakes being made, more harmonious color schemes in floor coverings, head linings, sidewalls and upholstery, more and more of a feeling of restfulness, repose and living room passenger comfort.

Despite this improvement, however, and despite the splendid achievements of certain pace-setting carriers, there is still plenty of room for further improvement in the choice of fabrics and color for transportation media of all kinds.

For one thing, transport management that is venturesome enough to experiment with the newer fabrics is rare. Most of them claim in conversation that they want something entirely new and different when renovation time comes around, but pretty generally, it turns out that the new and different mustn't be too new or too different from what they have had for fifty or a hundred years before. The green mohair of the Pullman seat, the better car upholstery, the familiar plastic seating of busses and subways have all been going on so long that they seem as natural and inevitable as the wheels that move them forward.

But there is no good reason why such fabric choices should continue to be perpetuated. Many of the new nylon fabrics and fabrics woven from extruded plastic filaments, many of the new weaves and departures from orthodox patterns in established fabrics, the vinyl-backed fabrics — all are suitable, effective, and durable for use in transport carriers, as witness their present use in the modernized coaches operated by the Long Island Railroad.

* * *

One has only to go out in the market and see the multiplicity of fabrics offered today to realize that what the transport industry needs is just a little more venturesomeness, a little less hide-binding adherence to the past, a wider utilization of the richness and variety of the materials that are theirs for the buying.

This will undoubtedly come in time. But, the time is now •

OLD AND NEW

The old Long Island Railroad coaches with their traditional rattan seat upholstery are being redecorated according to a color preference poll of commuters. The upholstery in the newly decorated coaches is made from sateen-backed plastic fabric in soft blue-green. Rust-colored window shades, ivory ceiling, and blue-green side walls complete the new scheme.

The publishers of American Fabrics
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Compilation of Terms

relating to

Industrial Textiles and Materials

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Industrial fabrics now comprise a major segment of the vast textile and allied industries. New terms, new significances, and new uses . . . of fibers, yarns, and fabrics . . . have risen on the industrial textile horizon and influence our present modes of living, urban and rural. In presenting this Compilation of Terms relating to industrial textiles, AMERICAN FABRICS *hopes to supply the need for greater knowledge and familiarity with fabrics which now play an important part in industrial production — fabrics made from the universal fiber, cotton; from asbestos; felt; plastics; leathers; and from man-made and synthetic fibers. Although the limits of space make it impossible to provide an exhaustive list of the terms used in the field, an attempt has been made to include all of the significant words, specialized names, and technical phrases which are of established importance in the expanding areas of the industry.*

ABRADED YARN: Continuous filament rayon yarn in which the outer filaments have been purposely cut or abraded at irregular intervals, leaving the major part of the filaments unharmed. Abraded yarns are usually plied with other yarns before being used.

ABRASIVE FABRIC: Cotton fabric coated on one side with emery, sandpaper, or some other abrasive. Used for polishing hard surfaces such as metals.

ABSORBENT COTTON: Stock, yarn, or cloth from which the natural, waxy, fatty matter has been removed in order to make it absorbent. Much used in medical and surgical fields.

ABSORPTION FABRIC: Cotton, jute, or other suitable fabric treated or impregnated with chemicals to absorb gases and vapors.

ACETA: Spun acetate which contains fibroin or casein; the fibers are altered in physical properties to give increased strength, rough surfaces, crimp, and other qualities.

ACETATE: Fiber, yarn or material made by the acetate process of manufacture. It is not a regenerated cellulose like viscose or cuprammonium, but is an ester of cellulose; namely, cellulose acetate. Acetate differs from rayon in that its physical and chemical properties are different, especially in its reaction to dyes; and an entire new set of dyes have been developed for acetate dyeing. The principal developmental work for acetate was done by the two brothers Camille and Henri Dreyfus of Basle, Switzerland.

ACETATE AND RAYON RULES: The following trade-practice rules on the use and the identification of acetate and rayon were announced on December 11th, 1951 and became effective on February 11th, 1952: The Federal Trade Commission has decreed that *rayon* is to be used for man-made textile fibers and filaments composed of regenerated cellulose; and yarn, thread, or textile fabric made of such fibers and filaments. The term *acetate* is to be used for man-made textile fibers and filaments composed of cellulose acetate; and yarn, thread, and textile fabric made of such fibers.

Practices to be considered unfair are general misrepresentation, improper identification, incomplete description, juggled weight-value listings, improper fiber emphasis by the size of the printing on the label, incomplete provision of fiber description along with the trademark, concealed adulterants, and incomplete fabric handling information on consumer labels.

ACETATE STAPLE: Three firms in this country produce the yarn which is available in sizes of 1½, 2, 3, 5, 5½, 8, 12, 16, and 20 denier.

ACETATE, STRONG: Acetate yarns that have a high tensile strength may be obtained by a special stretch spinning process. The yarn may be spun as fine as a $\frac{1}{10}$ denier, and if so desired, can be saponified to give the dyeing properties of viscose rayon yarn. It is also possible to produce it in the form of staple fiber, either straight or kinked.

ACRILAN: Formerly known as Chemstrand, this is a product of Chemstrand Corporation. It is an acrylic fiber which has many characteristics comparable with wool such as warmth, softness, and resistance to deterioration outdoors, stability and recovery from wrinkling. Other properties include moth-resistance, rapid drying, shrink-resistance, and crease-resistance. Used mainly in blending with wool, and in this application must be dyed separately as raw stock; also blended with viscose rayon.

ADHESIVE TAPE: Strips or splits of ordinary cotton fabric covered with an adhesive coating on one side. A universal household and industrial article.

AIRPLANE CLOTH: A strong ply yarn cloth, usually mercerized, of long staple Arizona or Egyptian cotton. Used as airplane fabric, shirting, and boys' wash suits, the construction is usually square — 80 x 80 to 92 x 92. It is made of 2/60s warp and filling and is finished at 36 inches wide. The cloth may be treated with a *dope* to make it waterproof, or water- and moisture-repellent, thereby aiding the fabric to withstand the elements. The goods have a breaking strength of about 75 pounds to the inch, and weigh about four ounces per yard.

AIRPLANE LUGGAGE CLOTH: Lightweight pyroxylin-coated cloth used in many types of luggage.

ALFORGAS: A heavy type of English duck.

ALGIL: A polystyrene fiber made into batting form from a fine diameter filament which does not absorb moisture. Algil is acid- and alkali-vapor resistant, is thermoplastic, and will burn under flame. Used as a substitute for kapok and as a filtering medium. Product of Polymers, Inc.

ALGIN: A product obtained from certain marine algae. It may be extracted from kelp or seaweed and has been spun into filaments on a commercial basis. Also used in printing pastes and as a dressing material.

ALGINATE FIBERS: These are produced by extruding alginate solution through spinnerets into solutions of beryllium sulphate or other chemicals. Various alginates differ in their properties; several are supposed to have good resistance to mildew. Beryllium alginate is said to be resistant to alkalis. The chief uses of the fibers are for experimentation in garnishing camouflage netting.

ALGINATE YARN: This is a yarn made from a seaweed base and is readily soluble in an alkaline solution. It is used as a scaffolding thread in the manufacture of socks, and has many other uses.

ALLIGATOR CLOTH: Plain weave, cotton or bast fiber cloth coated with a veneer or varnish and given a finish to resemble alligator skin. The material can be given an embossed or raised finish to enhance the appearance. Used for seat coverings, suit cases, brief cases, hand bags, shoes, covers.

ALUM LEATHER: Refers to a tanning process produced by alum used in combination with egg yolk, salt, and other substances. Prior to chrome-tanning, this was the principal method of tanning with mineral agents. The process is now used chiefly for glove leather.

AMERICAN CLOTH: English name for an enameled oilcloth used for upholstery in the home.

AMIDE: The resultant product of heating and combining a dibasic acid and a diamine.

ANILINE-DYED LEATHER: This term is used to distinguish leather which has been colored with aniline dyes from that which has been colored with pigment or other opaque materials.

ANTELOPE FINISH SUEDE: This is a lambskin, goatskin or calfskin that has been sueded and finished to resemble antelope.

ANTELOPE LEATHER: A fine, soft leather made from antelope skin, silken-like or velvety in sheen and texture. It is sueded on the flesh side.

APRON FABRICS: Used in the laundry, printing and other trades, these are webs of cotton duck ranging in width from a few inches to several feet. Used to conduct materials through machines.

APRON LEATHER: There are several types used on textile machinery. Comber and gill box leather is a soft, mellow, and tough leather, tanned from steer hides, heavily stuffed and usually handboarded or otherwise softened.

ARMY DUCK: A compactly woven cotton fabric of ply yarn in plain weave formation; the weights range from seven to twelve ounces per yard, based on a width of 28.5 inches. The army has a very large number of constructions.

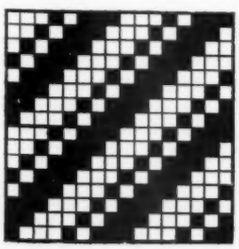
ARTIFICIAL LEATHER: Drill cloth, sateen, sheeting, and similar cloths are treated with nitro-cellulose compounds to imitate real leather. The fabric is often embossed and is extensively used for handbags, luggage covering, upholstery, millinery accessories, and wherever leather can be used.

ARTIFICIAL STRAW: A viscose rayon specialty product made by forcing the spinning solution through a rectangular shaped orifice in the spinneret into a suitable coagulating bath. It consists of a continuous, ribbon-like filament folded during spinning and resembling straw.

ASBESTON: A lightweight, fire-resistant asbestos fabric used to cover ironing boards. Made of lightweight asbestos yarn, the material gives good resistance to wear. Asbeston may be washed by hand and bleached if necessary to remove stains.

ASBESTOS: The most important mineral fiber, without which it would hardly be possible to have the conveniences enjoyed today. It is found in veins of the solid rock formation of the earth's crust. Asbestos is found chiefly in the Province of Quebec, while other sources are Ontario, New York, Vermont, Arizona, South Africa, and the Savoy district in Italy. Thetford, Quebec, is the greatest asbestos center in the world. Asbestos is a poor conductor of heat and electricity. It can be used where no other material will serve, and provides greater safety and longer-lived and better products in countless fields of industry.

Outstanding properties of the fiber are its ability to withstand high temperatures with little physical alteration, and its non-combustibility and great electrical insulating value so important to industrial engineering.



Right hand twill

$$\frac{3\ 1}{1\ 3}$$

even-sided twill.

ASBESTOS, CARDED FIBERS OF: The fibers are received at the plant in a semi-opened condition and are there opened, cleaned, and blended with varying percentages of cotton, rayon, or both fibers in consideration of textile end-uses. The fiber blend is then carded into roving and spun into yarn in much the same manner as cotton and wool.

Processed materials from the card alone represent products wherein many fibers have been aligned and formed into a more or less compacted mass, but which have not been twisted or formed to entwine the fibers as in a yarn. These products are known and used as carded fibers for chemical filtration purposes, for thermal packings, and for heat-resistant fillers. They are also used as lap for electrical insulation purposes, padding, stuffing, or wipes where thermal endurance is vital. In the roving condition, asbestos is used for electrical insulation on wires and cables.

ASBESTOS CLOTH: Has a wide variance of style, texture, grade, weight, and thickness. The standard width of fabric is 40 inches, although any width can be made for some desired purpose. Asbestos is woven in plain, twill, or herringbone effects and in either metallic or non-metallic construction. The fabric ranges in weight from a few ounces to several pounds per square yard. Thickness varies from .015″ to .100″ for single ply.

Uses of asbestos fabric include the following: conveyor belting; draperies; automobile, airplane and locomotive equipment; passenger, sleeping, express, mail and freight car equipment; electrical insulation for toasters, broilers, coffee makers, sweepers, fans, refrigerators, washing machines, etc. It is also used for friction materials, fire blankets, ironing board covers, jackets for pipe insulation, laminated plastics, packings, safety clothing, welding, and theatre curtains.

ASBESTOS CORD: A multi-ply yarn of very uniform diameter and superior tensile strength. It is used extensively as sewing thread, mantle yarn, tying cord, core for wire-wound electrical elements, gaskets and packings, and as a braided wall in the manufacture of steam hose.

ASBESTOS ROVING: An assemblage of chrysotile asbestos and other fibers that have been manipulated into a single strand without twist. *(See also Asbestos, Carded Fibers of.)*

ASBESTOS TAPE: Also called *listing*, it comes in the plain or non-metallic type and in the asbestos-metallic product which is the wire-inserted variety. Plain tape ranges from .010″ to .030″ in thickness, and its great use is in electrical insulating for motor windings. Its low heat conductivity and thermal resistance are important since its property of absorbing a high percentage of heat is an important asset.

Heavier plain tapes are used in thermal insulation, flameproofing of sheathed cable, and as a component part of gaskets and packings.

Asbestos metallic tape is used where service conditions require a high tensile strength or a high coefficient of friction. Where excessively high temperatures are encountered, woven tape is reinforced with special alloy wire. Much of this finds use in the fabrication of woven brake lining and clutch facing. Oil burner wicking and conveyor belting are two other major uses of this tape.

ASBESTOS TUBING: It is woven or braided, and is used chiefly as a flexible sleeving for insulating electrical conductors, and as a jacket for high temperature packing. Woven asbestos tubing is used as flexible heat ducts and as the filtration medium in dust collectors.

ASBESTOS YARN: It is used as a basic component in the manufacture of cord, tubing, tape, and fabrics for innumerable applications. Asbestos yarn, which is made by spinning the roving, is used principally in weaving and braiding where thermal resistance, electrical insulating properties, fire protection, and durability are necessary engineering requirements of the textile product.

AUSTRIAN SHADE CLOTH: A crinkled material that has wider stripes than those seen in ordinary seersucker. Varying in color scheme, the fabric is used in bedspreads, counterpanes, and curtains. It has considerable use for shades in hotels and stores.

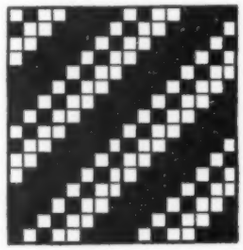
AUTOGENOUS BONDING: There are two methods used in the manufacture of non-woven fabrics: 1. Bonding by means of chemically activating the surface of the fibers to an adhesive state. 2. Activating the surface of thermoplastic fibers through the application of heat.

A means of compressing the fibers so activated is necessary in both methods. In the chemical application, one method would be to pass the fiber bats through a sulfuric acid bath of proper concentration and temperature, followed by compressing with a calender, washing and drying.

In heat bonding, it is possible to use various thermoplastic fibers produced at present. The unification is accomplished with heat and pressure.

AUTOMOBILE SLIP COVER FABRIC: A strong, tough, medium weight cotton, either stock- or yarn-dyed. Saran, Velon and kindred textile or plastic materials are also used.

AUTOMOBILE TIRE CLOTH: A rugged, heavy, durable fabric made from 9/23s, 10/23s, or 11/23s yarn. Square textures of about 24 x 24 are used. The tensile strength is generally the same in both directions. Made of cable warp yarn of long staple cotton, it has a single filling yarn of ordinary grade stock. Classed as a cord fabric which, incidentally, is always made from cabled yarn.



Right hand twill

$$\frac{4\ 1}{2\ 1}$$

warp-effect twill.

AVISCO 15: A dull, crimped, viscose rayon staple made especially for the carpet trade. This product of the American Viscose Corporation is made of 15 denier, hence the name.

AWNING CLOTH: Durable, stout duck or canvas which comes in all commercial widths for awnings, shelter tents, and large umbrellas. About one-half of the output is made with bright, colorfast, wide stripes; the remainder comes in printed stripe effects.

AZLON: A generic name for textile fibers made from protein sources, such as casein (milk), zein (corn), soybean, etc.

* * *

BACK FILLED: Cotton fabric that has been heavily sized with clay, starch, or other agents to fill up the interstices among the interlacings of warp and filling yarns. It is much used for artists' canvas, bookbinder, shade and sign painters' cloth.

BACK GREY CLOTH: A plain cotton fabric which lies between the rubber blanket and the cloth to be printed on a printing machine. The function of this cloth is to absorb excess dyestuff that penetrates through the material as it is being printed.

BACK LEATHER: It is formed by first cutting the hide longitudinally along the backbone, and then trimming off the head and the belly.

BACKING CLOTH: Broad term for fabric used as base or back fabric in making textile materials. Cotton or jute is used as backing in the manufacture of linoleum and oilcloth, rugs, carpets, etc. The term also signifies grey goods fabric, usually a print cloth, used to absorb surplus dyes and to reinforce fabric on the printing machine. *(See Back Grey Cloth.)*

BACKING YARN: This term is peculiar to pile fabric wherein the base yarn holds the pile yarn in place; formed by the stuffer yarn and the warp and the filling of the fabric.

(continued)

Industrial Textile Terms . . .

BAG LEATHER: Refers to leather used for traveling bags, suitcases, and straps.

BAG SHEETING, COTTON: Cotton cloths made from a wide variety of fabrics. Coarse yarns, 12s to 18s, are used. Textures range from 40 square to 60 square with a weight of 2.50 to 4.00 yards to the pound. These single-ply yarn cloths are used to make bag containers for feed, food, foodstuffs, fruit, grain, salt, sugar, and other food products.

BAGGING: 1. Loosely woven jute cloth used for covering cotton bales. 2. Cotton fabric, varying in texture and weight, used for bags and containers. 3. Broad term for any type of bag for industrial use.

BAKELITE: A plastic used for buckles, buttons, household accessories, and adornments.

BALATA BELT DUCK: A compactly woven material made with hard twisted, ply yarn. Made in broad widths, the weight of the goods is figured on the square yard basis.

BALINE: 1. Garment interlining made of cotton warp and horsehair filling in plain weave order. 2. Coarse fabric of hemp, jute, etc., used for bags and upholstery lining.

BALLOON OR TYPEWRITER FABRIC: Has the highest construction count of any plain weave cotton fabric — 120 to 180 in the warp, 150 to 170 in the filling. Finished from 38 to 45 inches in width.

When used for typewriter ribbon, in narrow width, it is necessary to de-size the fabric so that the dye will be evenly absorbed. Other uses are for airplane coverings, gas bags, ribbons, shirting, and underwear. The fabric may be treated or coated with cellulose acetate, latex, paraffin, or rubber for use in the raincoat trade.

BANDAGE: Narrow cotton or linen cloth of plain weave and low texture. Woven in widths up to 40 inches, the gauze is split into a variety of widths for hospital purposes.

BANDING: A woven or knitted narrow fabric, used for banding or tying cigars, caps, hats, bundles, etc. A better type of banding is used for decoration on dressgoods, neck banding, and to revolve cylinders on textile machinery.

BANDOLEER CLOTH: An olive drab, high texture, square woven sheeting used for cartridge belts and hand grenade belts.

BARK FIBERS: Shredded bark of the redwood and other large trees of the West Coast can be used in blends for mackinac, ski cloth, etc. Heavy fabrics with twenty to thirty percent bark fiber in content meet the testing requirements for the trade.

BARK TANNAGE: Leather tanned by the use of tannic acids that are found in barks, as apart from tanning done by mineral treatments.

BARRAGON: Moleskin cloth of highly twisted yarn used for work clothes.

BASEBALL LEATHER: Usually made from the fronts of horsehides. Inexpensive baseballs are made from the skin of sheep.

BASIL: Bark-tanned sheep or lamb skins that are uncolored.

BAST OR SOFT FIBERS: The flexible, long strand that comes from the inner bark of flax, ramie, hemp, jute, etc.

BEAD FABRIC: Synonymous with chafer fabric.

BED TICKING: Striped cotton goods made in twill or satin weaves. Ticking is a rugged, compact material used for mattresses and pillows. A typical layout for the fabric might be 90 x 60 in texture with warp yarns of 18s and filling yarns of 20s. Widths are 28½, 56, 72 and 84 inches.

BELLY: That portion of the hide from the under side of an animal; usually of inferior quality and lower in price than the upper areas of the hide.

BELT, BELTING DUCK: See Duck Belting.

BELTING LEATHER: Used to make transmission belting. Its main source is the butts of high-grade cattlehides.

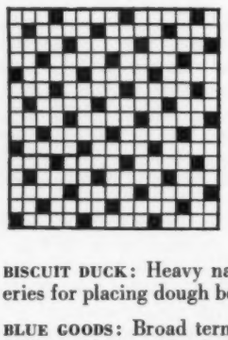
BEMBERG RAYON: The yarns and fabrics composed of products of the American Bemberg Corporation, noted for its cuprammonium *stretch system of spinning*. By 1924 the system was perfected to the point where it had genuine commercial value. This method of making man-made fibers is called the Stretch System because there is an actual stretching of the filaments in the spinning.

BEND: A sole leather back-bone area with the shoulder trimmed off.

BEUTANOL: Plastic-coated fabrics on the order of lawns and 80-squares, which have been given five coats of vinyl plastic to enhance pliability, hand, and finish. Fabrics thus treated may be washed and ironed, but this is usually not necessary since the fabrics are waterproof, dustproof and stainproof, as well as fire-resistant. Vat dyes are used instead of pigments in the coloring which precedes the coating treatment.

BINDER FABRIC: Rugged, strong cotton webbing which comes in several widths and thicknesses. Used for trunk straps and industrial mechanisms.

BINDING MUSLIN: A sized and filled, dyed and stamped cloth for bookbinding purposes.



Five-end satin base of two.

BISCUIT DUCK: Heavy naught duck used in bakeries for placing dough before actual baking.

BLUE GOODS: Broad term to imply cotton cloths in blue colors — certain chambrays, checked fabrics, denims, gingham stripes, institution cloths.

BLUE JEAN: Sometimes called jean, it is finer than drill which it resembles. It is stout and durable, made on a twill weave, and comes in white, solid colors, and stripes. Used for work garments and children's clothing, and to a considerable degree for army and navy clothing.

BOARDED LEATHERS: Hides or skins that are finished by folding with the grain side in and rubbing the surface under the pressure of an instrument called a hand-board. The work can also be done by machinery. Also goes under the name of box finish or willow finish.

BONDED FABRIC: One in which the structure consists of a web of fibers held together with a cementing medium which does not form a continuous sheet of adhesive material.

BONDING CHEMICALS: Casein, glue, gum arabic, cellulose acetate, melamines, resins, etc., used to bond or join textile fibers or fabrics.

BOOK CLOTH: A coarse, plain woven print cloth or sheeting. Dyed, heavily sized, often pyroxylin coated or embossed. From two to six treatments are given the material to insure proper sizing and coating. Care has to be exercised in making the filling substances match the piece dyed goods.

BOOK LINEN: A heavily sized cotton or linen material used in stiffening collars, belts, millinery crowns, and book bindings.

BOOK MUSLIN: Coarse, low-textured, heavy cotton which has been sized considerably. Usually given a glazed finish, it is used for underlining, millinery, book coverings.

BOOKBINDER'S CLOTH: Cloth made from several of the staple cotton cloths that is given a starching, glazing, and calendering. Used in binding books of the cheaper quality. Much filler material is used to cover up the spaces between the warp and filling in this low textured cloth which is dyed any color. Cotton or linen fabric thus treated is also used for belts, collar stiffening, and hat crowns.

BOOKBINDING LEATHER: Made of skivers, cattlehide buffings and splits, cowhide, goatskin, sheepskin, calfskin, and sealskin.

BOOT, BOOTLEG DUCK: See Ducks, Boot.

BOX CALF OR SIDES: See Boarded Leathers.

BRAID: A narrow textile band or tape formed by plaiting together or crossing diagonally and lengthwise several threads of any of the major textile fibers to obtain a certain width, effect, pattern, or style. Used for binding coat edges and for decoration in military uniforms.

BRAIDING MACHINE CARRIER: That part of a braider which holds the package of yarn, thread, or cord, and carries the yarn when the machine is in motion.

BREAKER FABRIC: Used in the manufacture of rubber tires, it is an open-mesh cotton fabric made with low-count yarn and leno or mock-leno weave.

BREAKER TIRE CLOTH: An open-weave fabric of any of the following constructions: warp and filling of ply yarn, hawser cords in both directions, hawser cords in warp with single filling yarn.

BREAKING LOAD: The maximum load developed in a tension-type test brought up to rupture of the sample being tested. The number of pounds at which the fabric became ruptured can be read from the instrument scale.

BRIDLE LEATHER: A harness-finished strap leather.

BUFFING: A very light cut of grain portion (about one-half) taken from the surface of cattlehide. It is produced usually in the manufacture of upholstery leather. Used for bookbinding and fancy leather articles.

BUFFING FABRICS: A wide range of cloths used for buffing and polishing purposes.

BUILDER FABRIC: Now largely replaced by tire cord fabric, the material is a square woven, heavy duck made with thick, heavy ply yarns. Ten to fifteen ply is used in the yarn, and the material runs from 17 to 23 ounces.

BURLAP: A coarse fabric of plain weave, usually made of jute or allied yarns. Much of the material is woven forty inches wide and is from six to fourteen ounces in weight per yard. Comes natural or may be dyed; when printed, finds use in curtains and hangings.

BURNETIZING: The impregnating of canvas or cordage with a solution of chloride or zinc to prevent rotting, and therefore used extensively on maritime fabrics and cordage.

BURSTING STRENGTH: In the ordinary sense, it is the ability of a material to resist rupture by pressure. In the specific meaning, it is the force needed to rupture a fabric by distending it with a force applied at right angles to the plane of the cloth, under specific conditions.

BUTT: That part of the hide or skin which covers the rump or hindpart of the animal; for example, horse butt. Belting butt is a whole cattlehide tanned for leather belting after the head, belly, and tail have been trimmed off. The butt-end is what remains after trimming off a double shoulder.

BUTTER CLOTH: Another name for cheesecloth.

* * *

CABLE NET: Net made of strong, heavy cotton yarn in which large meshes appear. Usually made in a doup construction for curtains and hangings.

CABLE TWIST: A cord, rope, or twine construction in which each successive twist is in the opposite direction to the preceding twist. This type of twist is S-Z-S or Z-S-Z.

CABLE WEBBING: A strong, heavy, round yarn or thread is used to make this twill woven webbing.

CABLE YARN: Name given to yarn of two or more ply that has been twisted together. More than two yarns are often plied together to increase the diameter of the cable effect. Cables have good twist and high tensile strength and are used for fancy yarns in suitings, coatings, and women's dressgoods of novelty or fancy design. High twisted and specially treated yarn is used for sewing thread.

CABRETTA LEATHER: In this country the word is used with reference to Brazilian sheepskins and can be applied to all hair sheep. The glove and shoe leather trades use much of this leather.

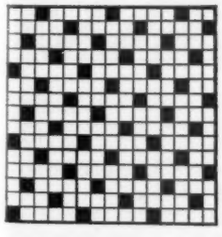
CALFSKIN: Leather made from skins of calves.

CANDLE FILTER: Candle shaped device which contains fine cambric or similar cotton cloth through which the viscose solution is forced from the spinning pump to the spinneret in order to remove the final traces of foreign matter.

CANDLEWICKING: A cotton ply yarn noted for its loose twist and soft feel.

CANTOON: A compact cotton fabric which has fine twill diagonals on the face and a napped back. A three-up and three-down twill weave is used and high texture in the pickage gives the fabric strength and wearing quality. Used for riding breeches and camping clothes.

CANVAS: Also known as Numbered Duck, this plain weave cloth is rugged and heavy. The ply yarns used give much strength and body to the fabric. From 2-ply to 14-ply yarns are used to make the goods. It is manufactured in the grey state or natural condition, but is also dyed olive drab or khaki for the armed services. Duck and



Five-end satin base of three.

canvas are more or less interchangeable terms today. Uses for canvas include tents, wagon covers, many types of army equipage equipment, sails, mail bags, sacks, etc.

CAPESKIN OR LEATHER: Glove leather that is made from imported hair sheepskins in which the natural grain has been retained. The term should be confined to the hair sheep of South Africa.

CARD BASIS: The Cotton Duck Association uses a price list to determine sales price for the various ducks on the market today in accordance with the many widths and weights of the duck.

CARDING LEATHER: A particular type of leather used on carding machines in the manufacture of textiles. It lies flat against the beds of the cards and the teeth have to be forced through it by a device made for this purpose.

CARISEL: Coarse, plain-woven cotton or jute cloth used as foundation fabric in making carpets. Textures are low, and the cloth comes in many widths.

CAROSEL: A dish toweling made by the Textile Division of United States Rubber Company; it is made of 80% cotton and 20% asbestos which contributes to absorbency and polishing properties.

CARPET BINDING: Narrow tape made of wool or cotton to bind the edges of all types of floor coverings and carpets.

CARPET WARP: A four-ply, strong cotton cord often used as the warp in rag and other types of floor coverings.

CARTRIDGE CLOTH: Made originally from silk cloth to hold powder charges for big guns; silk noil is ideal for cartridge cloth since it burns quickly and completely.

CASE LEATHER: See Bag Leather.

CASEIN FIBER: Synthetic protein fiber made from casein which is precipitated from skim milk. Lanital was the first casein fiber to appear in the trade, an Italian product. When cut to staple length, the fiber has many of the properties of wool. Fibers made from a base of condensed milk, evaporated milk, or skimmed milk are: (1) Germany, Triolan; (2) Holland, Lactofil, Casolana; (3) Italy, Lanital; (4) Belgium, Cargan.

CASEIN PLASTIC: Milk curd and formaldehyde make this plastic which has been in use since the turn of the present century. Except for the fact that this plastic tends to warp out of shape when placed in water, it makes an ideal substance for beads, buckles, buttons, and trimmings. It has high luster and is not injured by dry-cleaning fluids. Commonly known as Galalith or Galorn, it is mixed with wool for making felt hats, pillows, and upholstered furniture stuffing. It is also blended with the major textile fibers for women's winter dressgoods, and for socks.

CASLEN: Produced in monofilament and coarse staple forms, this fiber was originally developed as paint brush bristle. Spun in filaments of 145 to 1330 denier, the fiber is produced in straight or curled form.

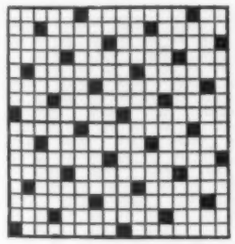
The fiber has possibilities as a substitute for horsehair in fabrics, and the curled form is used to replace hair in mattresses. Other uses for the continuous filament yarn are similar to those in which plastic monofilaments are today being used. Caslen is a trademark of the Rubberset Co.

CASTOR: Hair-sheepskin or goatskin leather that has been suede-finished on the grain side.

CATGUT GAUZE: Made by a special method in gauze or leno weaving whereby there is a double crossing of the warp ends between the picks, so arranged that the crossing spreads are held in place by the filling, always on the same side of the standard warp ends.

CELAIRESE: A successful replacement for other materials which for years have been used as filler for bathrobes, bedspreads, card-table covers, comforters, jackets, pillows. This product of the Celanese Corporation is a natural insulator; it launders or dry-cleans very well, and since it is free from foreign matter it remains clean and unaffected by atmospheric conditions or perspiration. Celairese is available in two colors, permanent pure white and a natural black which is inherent in the fiber.

CELANESE: The registered trademark of Celanese Corporation of America, used to designate its textile and other products. Celanese Corporation is the largest producer of yarns made by the cellulose acetate method. Certain characteristics set Celanese fabrics apart from others. Some of these features include retention of body in damp climates, easy application of dyestuffs, drapability, dimensional stability and ease in care.



Eight-end satin base of three.

CELAPERM: A color-pigmented acetate yarn with sealed-in color. Fabrics colored with Celaperm come in a wide range of colors and are claimed to be lightfast, washable, dry cleanable, and to withstand perspiration, gas fading, crocking and sea water. The term is a registered trademark of Celanese Corporation of America.

CELASTIC: A patented liquid which, when applied to fabric, first softens it to facilitate molding to shape, and when dry stiffens the fabric to preserve that shape. The liquid is used in preparing fabric for use in box toes of shoes.

CELCOS: A man-made fiber which contains acetate with a large percentage of viscose rayon. The first yarn in this field which combines set proportions of acetate and viscose rayon in a single fiber.

CELLOPHANE: Transparent cellulose sheeting made in the same manner as viscose yarn except that it comes in the sheet form. The sheets resemble metallic threads and do not tarnish as in the case of gold, silver, and aluminum threads. Cellophane is smooth, odorless, strong, and light in weight. Uses of the film yarn product are for curtains, hangings, shade cloth, belts and braids, fringes and lacing. In conjunction with other fibers, cellophane is used in the clothing and dress trade, and for decorative fabrics.

Other uses of cellulose derivatives are: celluloid, toys, non-flammable film, dope for airplane wings, thermoplastic materials, lacquers and finishes for automobiles, artificial leather, smokeless powder.

CELLUCORD YARN: This yarn can be woven with cotton, wool, jute, viscose rayon, acetate, nylon, and the other man-made or synthetic fibers. It can also be knitted, braided, or bonded. There are many applications for the product in industry — automobile seat covers, upholstery, furniture webbing, belts and belting, matting, shades, screens, welting, cable wrap, hampers and handbags.

CELLULOID: Made from a compound of gun cotton and camphor, it is used to imitate coral, ivory, tortoise shell, etc. Collars, belts, and novelties are made from it.

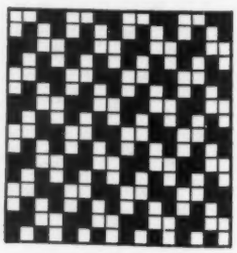
CELLULON: Made of celluloid on the principle of rayon staple fiber, it is spun on the cotton system.

CELLULOSE: A white, shapeless or amorphous substance which forms the cell walls of plant life. It is made up of woody, fatty, or gummy substance and amounts to about 96 percent content of the cotton fiber. Cotton minus its water content gives cellulose, which finds use in making nitro-cellulose from which gun-cotton is made, pyroxylin, cellophane, collodion and other commercial products. One of the greatest products made from cellulose base is the man-made fiber group of textile yarns

(continued)

— viscose rayon, cuprammonium, nitro-cellulose and acetate. Cotton linters or hemlock, pine or spruce chips, all vegetable matter are used as the base for these yarns.

CELLULOSE ACETATE: Filaments made of an acetic acid ester of cellulose which has been coagulated or solidified from the spinning solution; a type of man-made, cellulosic fiber which is a compound of cellulose and other chemicals.



Broken twill $\frac{2}{2}$

2 right hand
2 left hand.

CELTA: A hollow filament produced by the cuprammonium process, which makes a light, soft, fine but strong yarn similar to the multifilament Bemberg yarn.

CHAFER FABRIC: This special duck is often made with looped selvages, is practically square with regard to construction, and is used in the manufacture of rubber-tread tires. The ply in both warp and filling yarns ranges from two to six, and the fabric weight runs from 8 ounces to more than 16 ounces per square yard. Widths range from 40 to 60 inches.

CHAGIN: Synonymous term for cotton bookbinding cloth.

CHAIN CLOTH: Used for filter fabric, this compact, heavyweight cotton is made with two-ply yarn in both directions. Identified by the weave used — 2-up and 2-down broken twill, 2 ends of right hand and 2 of left hand; repeated on four threads each way.

CHAMOIS FABRIC: Cotton cloth that has been napped, sheared, and dyed to simulate chamois leather. The material must be designated as "cotton chamois color cloth."

CHAMOIS LEATHER: This soft leather was first made from the skins of the Alpine antelope, or chamois, now practically extinct. At present, it is made from the fleshers or the under-spit of sheepskins, oil-dressed, suede-finished, and used chiefly for cleaning and polishing purposes, as well as for gloves.

CHAMOISETTE: A fine, firmly knit cotton glove fabric which has a very short and soft nap. The napping is done by the emerizing process. The material is an imitation of chamois.

CHEESECLOTH: Narrow cheesecloths are under 36 inches wide; wide cheesecloths may be finished up to 55 inches wide. The cloth is loosely woven, thin, light in weight, open in construction. Carded yarns are always used. When the cloth is finished at 36 inches, it is called tobacco cloth.

Textures range from 32 x 22 to 48 x 48. Warp yarns are 28s to 30s, while filling yarns range from 39s to 42s. The cloth runs from 6 to 14 yards to the pound.

In the grey the cloth is used for covering tobacco plants and for tea bags and wiping cloths. Applied finishes include buckram, crinoline, and wigan. Uses of finished cloths include curtains, bedspreads, bandages, bunting, dust cloths, sign cloths, label fabrics, hat linings, surgical gauze, fly nets, theatrical gauze.

CHEMICAL COTTON: A term sometimes applied to purified and bleached cotton linters. Used as a source of cellulose in the manufacture of many products, such as different types of rayon, nitrocellulose lacquers, explosives, etc.

CHROME TANNAGE: Chrome is the mineral agent method chiefly used in tanning at the present time. The processes used differ to some degree, but all of them employ one or more salts of chromium. Chrome sulphate and bichromate of potash or soda are very popular bases. Chrome tanning is used for tanning practically all the shoe upper leather made in this country, such as kid, calf, and side upper leathers.

CHROMSPUN: Trade name for Eastman's made-in-the-color acetate yarn and staple fiber. The coloring agents are introduced at the solution stage, before the fiber is actually formed.

CIDER-PRESS CLOTH: A rather heavy, open-mesh cloth with low texture, 10 x 10. Coarse ply yarns are used.

COFFIN CLOTH: Black-dyed material made of cotton warp and wool filling for coffin interiors.

COIESCO: Made from the fatty membrane and the subcutaneous tissue left over from the dressing of skins for tanning. Conversion of the glutinous *fiber* from the inner side of the hide is obtained by the ordinary leather-tanning process. When tanned, the inner hide is treated at the correct pH to permit the fiber to resist deterioration. It is then dried and a spongy mass is obtained in the form of an aseptic tissue which can be carded. Made in Italy, the resultant fibers are 3 to 4 microns in diameter and suited for felting purposes or as a filling for blended materials.

COMBINATION TANNED: Tanning by two or more agents such as chrome and bark.

COMMERCIAL MOISTURE REGAIN: An arbitrary figure formally adopted as the regain, used in calculating the commercial or legal weight of shipments or deliveries of any specific textile material.

COMMERCIAL STANDARDS: The U. S. Bureau of Standards issues Commercial Standards which are not laws, but have great importance because these are "recorded voluntary standards of the trade." They are usually referred to by number.

COMPOSITION CLOTH: Cotton or linen duck or canvas which has been treated to make it waterproof. Used for bags and coverings.

COMPOUND FABRICS: Those which have more than one warp and one filling in construction. Tubular cloths are included in the term. Examples are French-back, pillow casing, mail-bagging.

CONSTITUTION CORD: Heavy cotton fabric which has the broadest cord or wale used in fabric construction. Of the corduroy family of fabrics, the repeat is on 12 threads each way, and eight harnesses are used in the loom to weave the material. A layout for the goods might be 42 inches in the reed, 31 inches finished with as many as 300 picks to the inch. Warp texture varies 16s to 20s yarn used for the filling. The reed and filling vary in that alternate pile picks are securely bound in the cloth to give firmness. The cord or cable effect is brought about by floats which appear some little distance from each other.

CONTRO: The rounded latex and cut rubber threads used as a cord and also wrapped with cotton, rayon, silk, etc., in manufacture of elasticized fabrics. Product of Firestone Tire and Rubber Co.

CORD: 1. When two or more ply yarns are twisted together they are sometimes known by this term. 2. Also known as the cordonnet, it is the raised, puffed or padded area in a motif in needlepoint lace. 3. Referred to as a wale, the term is used in certain fabrics made with a raised or corded effect — Bedford cord, bengaline, certain transportation fabrics, Ottoman, piqué, officer's belt webbing, Russian cord shirting, etc. 4. Short for corduroy. 5. Decorative woven fabric or braid used in the home, on epaulets worn by military officers and for regimental and other citations.

CORD FABRIC: In reality, this is not a fabric but merely an interlacing of about 26 ends of cable yarn with two to six single-ply yarn filling picks per inch. This loose net-like construction is run into the rubber solution in the manufacture of automobile tires. Incidentally, the number of layers of cord fabric determines the ply of the tire.

CORD TIRE: Types of tire in general use consisting of built-up layers of rubberized cord plies covered with a breaker strip and thread rubber, and having a rubber-covered steel cable built in at each side where the tire fits onto the rim.

CORD YARNS: When six, eight, or more yarns are plied or twisted together they are known as cord yarns. Uses include duck, canvas, tire fabric, webbing, conveyor belting, etc.

CORDAGE: A general term which includes string, twine, cord, rope, banding, and cable made from fibers. The term, today, implies that cordage is usually made from abaca, henequen, cantala, phormium, palma, or piteira.

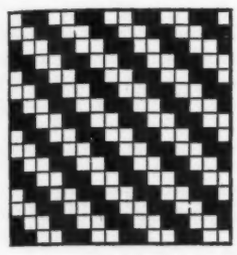
CORDOVAN LEATHER: Named for Cordova, Spain, the term now implies the leather made from the shell of horse butts. The rear portion, incidentally, begins about 24-inches from the tail. Cordovan is used for shoe uppers and leather puttees. The leather is non-porous and long-wearing.

CORDURA: A rayon process yarn with great strength, used for tire cords. As the tire heats up and drives out moisture, Cordura becomes stronger. Product of E. I. du Pont de Nemours & Co., Inc.

CORE YARN: A poor quality core or center yarn is entirely covered by twisting a better grade yarn around it. Core yarn may be used to decrease the value of a cloth and to lower the price.

CORK CARPETS: Made of cotton or jute yarn, this coarse, plain weave material has a layer of ground cork cemented over it.

COTTON: A white, brownish-white, or bluish-white, soft, fibrous substance that surrounds the



Left hand twill $\frac{3}{2}$.

seeds of certain plants of the mallow family called *Gossypium.* Cotton is the most important and versatile fiber known to mankind. It is used in underwear, outerwear, accessories, decorative materials in the home, and in industry.

Cotton may be used to make cheap cheesecloth, tobacco cloth, or print material. It may be used to make fine drawnwork materials whose price may run into hundreds of dollars in value. Fine cotton work is produced in Europe where most of it comes from the religious schools in which the manipulation of cotton yarn, thread and cloth has been taught for centuries.

The United States now produces about thirty-five percent of the world production; India is the second largest producer of the fiber. Brazil, Egypt,

Central America, China, Mexico, and Peru are other noted producing areas.

In this country about twelve times as much cotton is used per year as scoured wool. About three times as much cotton cloth is produced annually, on a square yard basis, as all other textile cloths combined. Only 15% of the available cotton raising area is used for this purpose; hence, the supply can readily take care of the constantly increasing demands of industry.

COTTON BACK SATEEN: A cloth, made in silk or rayon mills, single in construction and with good body. When made of a 5-shaft satin weave, it is called sateen; when made of 8-shaft satin, warp-effect, it is known as a Venetian. The fabric is finished in special widths that range from 26 to 58 inches; textures range from 64 to 190 by 48 to 72. The use of the fabric determines the texture of the goods. Cotton back is dyed in all colors.

Uses include blanket binding, comfortables, corset coverings, draperies, dressing gowns, bedspreads, brassieres, mattresses, pajamas, parasols, pillows, ribbons, shoe uppers, slips, suit linings, ticking, underwear, umbrella fabric.

COTTON BAGGING: Made of jute, it is used for baling cotton.

COTTON FELT: An undyed cotton cloth, heavily napped on both sides. Serves as silence and preserving cloths under table covers.

COTTON LINTERS: Short-fiber stock that is used to make absorbent cotton, gun cotton, rayon, celluloid and other products from cotton and its seed. Linters are not used to make cotton yarn. The fibers are obtained from second-time ginning of the cotton. First-time ginning is done in the plantation areas at the community gins.

Linters come in a brown sheet form and cost only a few cents per pound. Their greatest use is in making rayon for which they serve as the base. When treated with strong acids, linters form the basis for gun cotton which is used for explosives. The term should not be confused with lint.

COTTONADE: Made to simulate worsted cassimere for men's trousers and suits. It is dyed in dark shades and is designed like worsted goods. Cottonade gives good service and is an ideal suiting fabric for the lower priced trade in warm climates. Much of the goods are used in the south, and in South American and South African trade.

COURT PLASTER: Thin silk or cotton material that is treated on the one side with medicated glue to adhere to the skin or bandage. Made in white, black, pink.

COUTIL: The French term for drill. The material is made from a three harness, warp face, herringbone twill. This strong fabric, which is woven compactly, is usually higher in count and heavier than jean cloth. Some coutil is made with stripes or figured effects. The yarns used are about the same as those found in medium weight sheeting. Uses: drop curtains, corsets, brassieres, surgical belts, draperies, ticking, work clothes, linings, sports wear, and suit banding for use in tropical countries.

COVERT, COTTON: Made of single yarns with mock twist (half white, half black or blue, etc.) which give a flecked or mottled effect of a two-ply woolen covert yarn. Warp twill weaves are used to make the fabric. It is the lowest cost fabric of good weight for work clothes. Some of the lighter weights find use in shirting.

COWHIDE LEATHER: Made from the hides of cows, although the term is applied loosely to characterize any leather tanned from hides of animals of the bovine type.

CROP: A *side* of leather with the belly cut off, retaining both the head and the shoulder.

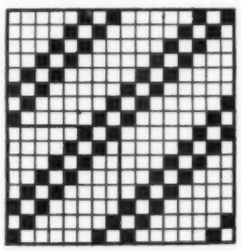
CRUSHED LEATHER: That which has the natural or artificial grain or design smoothed by rolling, plating, or some similar process in such a manner that the outline of the grain or design is preserved.

CUPRAMA: A rayon staple fiber, wool-like in characteristics, and made from a cellulose base. It is made in 2 to 20 denier sizes and staple cuts range from 1-9/16 inches to 6-inch lengths. Cuprama can be dyed naturally and much of the product is now dope-dyed or solution-dyed. Product of Farben-Fabriken Bayer.

CUPRAMMONIUM: The second method, in historical order, of making rayon. The product is a regenerated pure cellulose. Generally referred to as Bemberg rayon, manufactured by the American Bemberg Corp.

CUPRESA: A continuous filament cuprammonium rayon yarn which comes in denier sizes ranging from 25 to 150 denier. It can be dyed naturally and much of it is now dope or solution-dyed. Product of Farben-Fabriken Bayer.

CURRYING: A secondary process of finishing leather after tanning for particular end-uses.



Right hand twill

$$\frac{1\ 1}{1\ 5}$$

filling effect twill.

CUT RUBBER YARN: The original core yarn cut into size from a rubber sheet form. Its uses are about the same as those of Lastex.

CUT STAPLE: The same as rayon staple fiber, it is the mass of rayon filaments which have been cut to short and uniform lengths. Staple stock may be cut as short as the cotton fiber or as long as the longer wool fibers. When these short rayon fibers are spun into yarn, in the same manner as cotton or wool, the product is known as spun rayon yarn.

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DACRON: Trademark name for the synthetic polyester textile fiber produced by E. I. DuPont de Nemours & Co., Inc. Formerly known as Fiber V, it was first developed in England under the name of Terylene, and the American rights were obtained in 1946.

Dacron is a condensation polymer obtained from ethylene glycol and terephthalic acid. It is not related to or connected chemically with nylon or the acrylic fiber Orlon.

The properties of Dacron include high tensile strength, high resistance to stretching, both wet and dry; good resistance to degradation by chemical bleaches and to abrasion. Fabrics made of the fiber in filament or staple form indicate excellent resilience and resistance to wrinkling, easy laundering and quick drying, and they can be heat-set. The fiber has good electrical insulation properties and is not weakened by fungus, mold or mildew.

The continuous filament yarn finds use in V-belts, curtains, dress fabrics, high pressure fire hose, men's shirtings and sewing threads. Staple fiber stock of Dacron is ideal for mixing with wool in men's and women's wear suitings; also in dress fabrics, knitted wear, and washable woven sportswear items.

D-AND-T DENIM: Contraction of *double-and-twist.* Made of solid color warp and mock-twist filling, this type of denim withstands rugged wear. It should be noted that the filling yarn used is single and not ply.

DATA, INTERPRETATION OF NUMERICAL: These and comparable figures, found on labels or tickets of man-made and synthetic cloth bolts, may be interpreted as follows:

1. 128 x 64. This is the pick count of number of warp ends and filling picks per inch in the woven cloth.
2. 150/40. This means the denier is 150 and that there are 40 filaments in the yarn.
3. 25/1 50/50. Viscose-acetate. This implies that the yarn size or count is a single 25s on, say, the cotton or worsted system of figuring yarn counts. The cotton standard is 840, the number of yards in one pound of a number one cotton yarn; worsted is 560. The 50/50 means that the filling is 50 percent viscose content and 50 percent acetate content.
4. 30/2. This means that the count or size of the yarn is composed of two single yarns, each a single 30s to make the 30/2 yarn. The single equivalent of this yarn would be a single 15s. If figured in the cotton system, there would be 840 x 15, or 12,600 yards of yarn in the pound.

DEGRAINED LEATHERS: Suede-finished glove leathers of imported hair sheepskin that are finished on the grain side. This term is not so ambiguous as "imported suede" which is used at times to describe these leathers.

DENIER: Actually a coin used as a unit of weight when speaking of the size of silk, rayon, acetate rayon, and other filament yarns. One denier weighs .05 grams. Originally it was a coin, about the size of a fingernail, used in the time of Julius Caesar. The denier lapsed into oblivion and was revived by Francis I of France, the father of the silk industry.

The weight of 450 meters, or 492.2 yards, is .05 grams for a 1-denier filament. There are 4,464,528 yards in one pound of a number one denier silk, rayon, or acetate filament.

A new method of finding denier is now being used in France. The yarn numbering is based on the weight of 1,000 meters-unit per kilogram. Thus, a 60s yarn would have 60,000 meters of yarn per kilogram, which is 2.2 pounds.

DENIM: This staple cotton cloth is rugged and serviceable, and is recognized by a left-hand twill on the face. Coarse single yarns are used most, but some of the cloth used for dressgoods may be of better quality stock. A 2-up and 1-down or a 3-up and 1-down twill may be used in the weave formation.

Standard denim is made with indigo blue dyed warp yarn and grey or mottled white filling. It is the most important fabric in the work clothes group and is used for overalls, coats, jumpers, caps, etc. Denim is also popular in dressgoods and in the upholstery and furniture trades.

DENSITY: The weight per unit volume expressed as grams per cubic centimeter, pounds per cubic foot, or the equivalent.

DOESKIN: A trade term applied to white sheep and lamb skins that are tanned by the formaldehyde and alum process. In textiles it is a heavy twilled cotton cloth napped on the one side, or a closely cropped woolen material used in men's wear. The term doeskin finish is also used.

DOLE: A group of rayon skeins; there are from 10 to 20 doles in a rayon bundle of 10-pound weight.

DOMESTICS: English term for cotton fabrics in plain weave, but varying in quality. The average domestic is made of about 60 ends of 24s warp and about 60 picks of 36s filling. The grey cloth is finished in a number of different effects.

(continued)

DOPE: A pyroxylin, nitrocellulose base used in combination with color as a coating for fabric to make it impervious to air, water, or both. The term is used in many industries for any of several liquids applied to materials.

DOUBLE SPUN YARN: Yarn that has been given two twisting operations, both in the same direction. Twist is S-S or Z-Z. Used in some crepe, hard-spun, and voile yarns.

DOUBLE WARP: Two-ply warp fabric made in the British Isles is often referred to by this term.

DOWLAS: A low priced sheeting or roller toweling made from a half or full bleach cloth of linen warp and cotton and linen filling. It comes in three widths — 39, 46, and 56 inches.

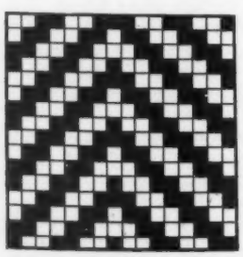
DRILL: A durable cotton fabric of relatively low count, coarse yarn, and medium weight. Most of the drill made today uses a 3-harness, warp-face, left hand twill weave; other comparable constructions, however, are used. Carded cotton sheeting yarn is used and textures and weights vary considerably, depending upon the terminal use of the material. When dyed, drill may be known as khaki, herringbone, silesia, ticking, etc. Since the term, drill, denotes the purpose for which the cloth is to be used, and not the weave as might be supposed, some fabric of this name is made with a small satin weave.

DRILL WEAVE: Name given to a 3-harness, warp face twill weave; the 2-up and 1-down twill effect.

DRILL, WIDE INDUSTRIAL: It is made on a three-leaf twill, left-hand, and in warp-effect. Finished at about 59 inches, the texture is 68 x 40, and there are about two yards to the pound. 14s warp and 20s filling are used in the fabric which serves as a basis for coated textiles.

DRUGGET: A printed and felted fabric made from any number of textile fibers and used for floor covering. This heavy fabric comes in all sizes and in brilliant designs. Stencil print motifs are very popular on these rugs which originated in India and are widely used in the United States.

DUCK: The name duck covers a wide range of fabrics. It is the most durable fabric made. A closely woven, heavy material, the most important fabrics in this group are known as number duck, army duck, and flat or ounce duck. Number and army ducks are always of plain weave with medium or heavy ply yarns; army ducks are lighter. Ounce ducks always have single warp yarns woven in pairs and single or ply filling yarns. Other names for variations of these fabrics are sail duck,



Pointed twill $\frac{2}{2}$

8 right hand

8 left hand.

belt duck, hose duck, tire duck (such as breaker, cord, chafer), wide and narrow duck, biscuit duck, harvester duck, oil press duck, wagon duck, enameling duck, boot duck, canvas and so on. Generally made of ply yarns in warp and yarns of various sizes and weights in filling.

DUCKS, ARMY: Compactly woven fabrics whose weight ranges from 7 to 12 ounces per yard, based on a width of 28.5 inches. They are of the same type as wide or number ducks but have finer yarns, higher textures, and are usually lighter in weight. Army ducks are made in 72-, 81-, and 90- inch widths for the laundry trade. When piece-dyed in summer colors they are called sail cloth. In the grey goods condition, the fabric is used for folding chairs, hammocks, laundry bags, linings, shoe uppers, and tool kits.

Finishes used are bleached, printed, painted-awning stripe, starched, sulphur, and mineral-dyed, waterproofed. In the finished state, the fabric is used for aprons, awnings, coats, hammocks, looseleaf book covers, overalls, pup tents, slacks, tents, tropical clothing, wading pools, washable uniforms, water buckets, and work pants. When dyed khaki or olive drab, the fabric is used for army cots, gun and instrument covers, knapsacks, leggings, tarpaulins and tents.

DUCK BELTING: Plain weave fabric, 42 inches wide, that has a texture of about 25 x 15. This 30-ounce goods is made of 7/5s warp and 7/7s filling, carded yarn. It is used for conveyor belting.

DUCKS, BOOT: Coated on one side, these boot ducks have a low texture and are made from ply yarns. The loose interlacing of the warp and the filling affords ample space for the rubber treatment; the ply yarns give the strength, while the untreated side forms the lining. Made in a 40-inch width, the texture is about 28 x 17; the fabric weight is about 8 ounces per yard.

DUCKS, COMBED: These are made on contract only; they are constructed in plain weave with ply yarns. When bleached and given a mercerized finish, they are used for doctors' and naval officers' dress uniforms, suitings, and shoe uppers.

DUCKS, DOUBLE FILLED, FLAT OUNCE: Because of the ply yarn filling used, this type is stronger than single filled ducks. A laid warp is used in making the fabric; each pair of warp threads weaves as one thread. Sizing of the warp is an asset in weaving. Enameling duck is a member of this group. It serves as the base for coating to make oilcloth, imitation leather, etc. The wide type of this duck is called wagon cover duck.

Those ducks made pro rata to 29 inches, 8 ounce weight, are called *Regular;* to 29 inches, 10 ounces, *Heavy*; to 29 inches, 12 ounces, *Extra-heavy.*

The grey goods may be used for blowout patches, imitation leather, oilcloth bases, bookbinding, caps, folding chairs, covers, linings, and shoe uppers. Finishes applied to this type of fabric are bleached, dyed, painted-awning stripe, printed, and water-repellent. Finished goods are used for aprons, awnings, backs for loose-leaf books, caps, folding chairs, overalls, trousers, washable clothing, and work pants.

DUCKS, FLAT OUNCE: They are made with single-warp yarns that are sized for weaving purposes. Two warp yarns are laid together and woven as a single end, known as laid warp or taped warp arrangement. The effect is a filling rib weave, the same as that used in Oxford shirting. Thus, the cloth has a flat appearance and hence the use of the term flat.

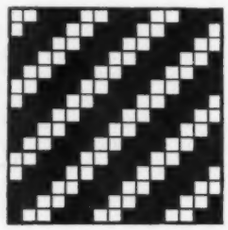
Single filling yarn is referred to as single filled, or S. F. duck. When ply yarns are used in the filling, the fabric is referred to as double filled, or D. F. duck. Duck is never woven with single warp and single filling yarns.

The converting trade uses the following widths of goods: 29, 36, 38, and 40 inches. Special weights and widths are made for the shoe duck, enameling, clothing, and wagon duck trades. They may be coated with rubber and pyroxylin. Some flat ducks are treated with resin, laminated, or pressed together and made into gear wheels. Quotations specify the width, weight, and ounces per linear yard without mention of the particular construction.

DUCKS, NARROW AND EXTRA-NARROW: They are made in weights similar to sail duck. The widths vary from 6 inches to 20 inches.

DUCKS, NAUGHT: Those heavier than No. 1 are called naught ducks and are designated as 1/0, 2/0, 3/0, etc. A 1/0 duck weighs 19 ounces for the 22-inch width; 2/0, 20 ounces for the 22-inch width. These ducks are made from 1/0 to 15/0, inclusive. Naught ducks from 3/0 to 15/0 are also known as biscuit ducks. The widths range from 6 inches to 56 inches.

DUCKS, NUMBER: They include naught ducks, narrow and extra-narrow ducks, sail ducks, and wide ducks. These ducks are the heaviest and strongest that are made. Carded ply yarns are always used,



Right hand twill $\frac{3}{2}$.

and since the warp yarns are strongly plied, they are not sized for weaving purposes. Maximum strength and weight is obtained by the use of multiple-ply yarns which range from two to fifteen ply for the heaviest ducks.

The strongest number ducks are usually in the grey state for utility purposes; in this condition they are naturally non-absorbent and, in addition to the compact texture, are highly resistant to water penetration.

Uses of number ducks include armored tank liners, army cots, conveyor belting, deck canvas, felt-dryer aprons, golf bags, heavy-duty bags, hose of many types and uses, knapsacks, laundry bags, mail bags, navy hammocks, oil-press cloth, portable water tanks, sail cloth, tarpaulin, tents, truck covers, and water buckets.

Some of the fabric is made flame-resistant or mildew-resistant. Heavy ducks are usually made from 7s yarns, in varying plies: 7/3, 7/4, 7/5, up to 7/13 used for 12/0 duck. Lighter weight ducks usually employ 13s yarn of varying plies.

DUCKS, SAIL: They are number ducks made in 22- and 24-inch widths; the latter width is called English sail duck. Sail ducks are made in 2/0, 1/0, and numbers 1 to 12, inclusive. Sail and wide ducks are woven with a blue warp end near each selvage, which serves as guide in sewing; the heavier the fabric, the farther away the blue line is woven from the extreme selvage ends.

DUCKS, SHOE: Made in a 37-inch width, these may be D. F. flat ducks or ply yarn army type fabrics. Firmly starched in the grey or bleached state, they are known as white starched. Unbleached goods are called brown starched. Textures range from 58 x 52 to 48 x 40. The chief use of this type is for shoe linings.

DUCKS, SINGLE FILLED, FLAT: Made in two grades, A and B; the former is the better grade. Grade B is used for dark colored fabrics which are often treated for some definite purpose. Widths vary from 20 to 90 inches; textures range from 72 x 20 up to 88 x 32. Warp yarn is 8s to 14s, filling, from 5s to 12s.

Uses in the grey are as a base for coating, bookbinding, covers for box springs, gaskets, linings, sneaker shoe uppers, and upholstery. Finishes applied are dyed, printed, starched, and white. Finished goods are used for book covers, overalls, summer caps, suiting, washable uniforms, white-duck pants. These are made usually in 29- or 38-inch widths, while the textures range from 84 x 28 to 72 x 20.

DUCKS, SPECIAL: These are variations of number ducks which are made in special weight, widths, and textures for definite purposes. Examples are belt duck, dryer felt canvas aprons for paper mills, and hose duck. Belt duck is usually made in a 42-inch width; the weight ranges from 24 to 32 ounces per yard.

Dryer felt duck is very heavy, a naught type duck; it is the widest cotton cloth made — 244 inches. It may be made of all cotton, asbestos warp and cotton filling, all asbestos, or all wool. Widths begin at 26 inches and the weights vary from 48 to 58 ounces per square yard. Hose duck is usually 40 inches in width; weight ranges from 8 to 22 ounces per square yard.

DUCKS, WIDE: This type varies in width from 26 inches to 144 inches. The standard weight of all number ducks is based on No. 3 sail duck, which is 22 inches wide, 16 ounces to the running yard. For each ounce less in weight, one is added to the number; for example, a No. 4 duck would weigh 15 ounces for the 22-inch width. The ducks are made up to a No. 12 which weighs 7 ounces for the 22-inch width.

The widths of wide duck, sail, narrow and extra-narrow ducks, whether standard or made on contract, are made pro rata to their particular weight in 22-inch sail duck. For example, a No. 6 duck, which weighs 13 ounces for the 22-inch width, would weigh 26 ounces in the 44-inch No. 6 wide duck. For ducks heavier than No. 3, the number is one less; No. 2 would weigh 17 ounces for 22-inch width; No. 1, 18 ounces for the 22-inch.

DULESCO RAYON: The semi-dull rayon yarn produced by Courtaulds, Ltd.

DULL YARN: Rayon yarn which has a very subdued luster, usually produced by incorporating finely divided particles of titanium dioxide in the spinning solution.

DUNGAREE: Work overall fabric made of coarse cotton denim, usually blue. Originally it was used for sailors' work clothes.

DUPLEX SHEETING: A 4-end, reversible twill weave is used in this soft-filled sheeting which is finished with a heavy nap on both sides of the fabric. Used for table felt chiefly, it comes in light weights and is napped on both sides and then sheared to give a suede effect.

DYNEL: A staple fiber spun from a copolymer of acrylonitrile and vinyl chloride. The name distinguishes it from the older Vinyon yarns developed by Carbide and Carbon Chemicals Corporation. Features of this fiber include strength, warmth, and quick drying properties, good dimensional stability, and resistance to acids and alkalies. It will not support combustion, is completely moth- and mildew-proof, can be dyed with either acid- or acetate-type colors and is easily processed on the cotton, woolen, worsted or silk systems.

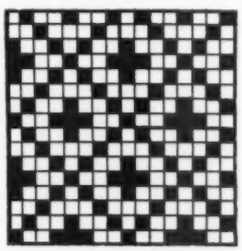
Dynel comes in filament sizes of 2, 3, 6, 12 and 24 denier and in staple lengths of 1⅜, 1½, 2, 2½, 3½ and 4 inches.

* * *

ELASTIC: A rubber band, cord, fabric or thread which has springiness, flexibility and resiliency. There are several types of elastic used in the textile trade today: lastex, cut-rubber yarn, extruded latex, filatex, rolled latex, and laton. These elastic yarns are used in belts, garters, girdles, gloves, shoes, sports wear, suspenders, etc.

ELASTIC FINISH SHEETING: An open-texture sheeting that is given firm starching and a flexible finish. Used for interlining, the cloth has the property of returning to original shape when pulled out or distorted.

ELASTIC WEBBING: Narrow fabric made with rubber or elastic threads as noted in belts, garters, suspenders. Lastex for suiting fabric is a development from elastic webbing. It is possible to make elasticity in either direction depending on the weave used in the cloth construction.



Fancy spot weave made on principal of pointed twill.

ELASTIC YARN: A yarn possessing a high degree of elasticity. Usually consisting of a core of rubber covered with cotton, rayon or other material. Used in garters, corsets, foundation fabric.

ELK: Strictly a trade term for cattlehide shoe leather of special tanning and finish. Genuine elk is designated by the term *buckskin*. Smoked elk or elk-side leather is known in the leather trade as cattlehide shoe leather.

EMBOSSED LEATHERS: These are finished by stamping designs on the hides or skins with etched, engraved, or electrotyped plates or rollers. The effect is used on fancy pocketbook leather, upholstery, and bag leather and splits, and occasionally on shoe-upper leather. The motifs may be a simulation of the natural or conventionalized grain of skins of various animals, as well as of purely artificial nature.

EMERY CLOTH: Cotton or linen cloth coated with fine, powdered emery and used for polishing.

ENAMELED CLOTH: Imitation leather material used in luggage, trimming for carriages, overnight bags, table covers, millinery trimming, etc. There are many qualities of this glazed finish material based on the sheeting, drill or other grey goods which may be used.

ENAMELING DUCK: Plain woven fabric with a laid warp and ply-yarn filling. Weight is based on a width of 46.5 inches.

END-AND-END WARP: A warp made from two warps by taking the ends from each warp in an alternating order when the warp dressing is done.

ENGINEERS' CLOTH: Broad term for denims, dungarees, heavy drills, and overalls.

ENKA RAYON: American Enka Corporation trade name for its viscose process rayon.

ENSIGN CLOTH: Plain woven cotton or linen cloth used for bunting and flags.

ESTRON: The trademark name for Eastman acetate yarn and staple fiber of one or more esters of cellulose with or without lesser amounts of non-fiber forming materials. In addition to its many uses in the apparel field, it is used industrially for electrical insulation. Plasticized Estron acetate staple offers a wide range of applications in fiber-bonded webs, and as base materials for the manufacture of oil cloth, linoleum, artificial leather, etc.

ETHYL CELLULOSE: Produced experimentally by the Dow Chemical Company, it is known by the trade name of Ethoraon. The properties impart qualities of good flexibility, toughness, and low moisture absorbency.

EXPRESS STRIPES: This fabric is made with a 2-up and 1-down, left-hand twill on the face and there are usually 12 ends in the pattern. The cloth has equal stripes of white and dark blue in the effect. Very rugged cloth that provides good wear, it is used for coveralls, overalls, jackets, etc.

* * *

FABRIC COUNT: The number of warp ends and filling picks per inch in woven fabric; also called texture, thread count, pick count.

FABRILITE: An elastic-supported vinyl plastic upholstery built for shaping around curves without folding or pleating. The product is backed with a knit fabric which prevents the upholstery from becoming baggy. Its resistance to cracking, scuffing, and abrasion is outstanding. A product of

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E. I. Du Pont de Nemours & Co., Inc. used in the automotive and furniture industries.

FACE GOODS: Materials which have had the nap raised, sheared, and then brushed down. Moleskin and doeskin are examples.

FACING LEATHER: A lightweight leather that is used to face the seams and to bind the edges of shoe uppers.

FANCY LEATHERS: This describes leathers, made from hides and skins of all types, which gain commercial importance primarily because of the grain or the distinctive or unusual finish, whether natural or the result of processing. Such processing may be graining, printing, embossing, ornamenting (to include gold, silver, aluminum, or other effects); or it may be any other operation affecting or enhancing the value of the leather through the production of a grain or distinctive finish.

FELT: From the Anglo Saxon meaning, *to filt* or *filter*, a defacating device. The cloth is a matted, compact woolen material, of which melton might be cited as an example. There are two types of felt cloth — woven and unwoven. Felting is accomplished by an interlocking of the natural, scaly serrations on the surface of the contiguous wool fibers through the agencies of heat, moisture, steam, pressure, and hammering.

FELT AND FELTED MATERIALS:

1. **FELT FABRIC:** A felt cloth is made with no system of threads, but is constructed by an interlocking of the fibers of stock to be used. There is a woven felt cloth, however — papermakers' felt cloth — that is used in the newspaper presses and is made of the best wool obtainable. The nature of the uses of this fabric makes it necessary that the fabric be woven.

Felt fabric is made by subjecting the stock to be used to heat, moisture, water, pressure, and in the case of derby hats and other stiff felts, shellac. The amount of shellac used depends on the desired stiffness of the finished material.

Leading felt products are felt hats, the most important felt item; banners, pennants, slippers, linings of many types, piano hammers, board erasers, insoles, etc. Any and all types of stocks, wastes, etc., find their way into felt cloth.

2. **FELTED FABRIC:** This type of woven material is also known as fulled or milled cloth. Felting, fulling or milling is the process resorted to in order to give woven cloth a thick, compact, substantial feel, finish, and appearance. The construction of the goods is covered up and not seen when the cloth is examined. Napping and shearing may be applied to aid in making felted cloth. The effect may be produced on woolens and cottons.

Felted material runs from medium to heavy in weight. Most of it is used in outerwear during the cold months. Cloths that may be felted are flannel, cricket cloth, molleton or silence cloth; many types of overcoating, such as melton, kersey, beaver and broadcloth; fleece coats, reefers, ulsters, and heavy uniform goods. Certain suiting and dressgoods material, robes, and blankets are felted.

The process of fulling and felting is like that of removing a spot or stain from a cloth or garment. In rubbing the affected area the cloth has the tendency to felt or mat, and the fibers to interlock. This tends to cover up the weave construction and gives the goods a felted appearance. Soap, heat, water, friction, and proper temperatures produce the felted effect seen on woven goods. Felting covers up the spaces between the interlacings in the weave, gives compactness to the goods, and thus affords more warmth.

Felt may be made of:

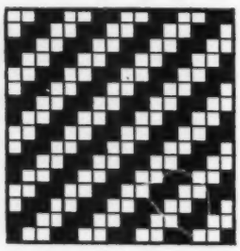
a. Camel and goat hair.
b. China cotton.
c. Other cottons.
d. Cow and rabbit hair.
e. Flocks and other mill wastes such as card strippings, shear wastes, willow wastes.
f. Reprocessed or new wool.
g. Reused wool.
h. Shoddy, mungo, extract wool.
i. Short staple wool noils, the most important fiber for felt.

FELTED MATTRESS: A mattress filled with packed layers of cotton felt.

FELTING FINISH: Staple cotton finish given to materials by napping, brushing, and pressing under heavy pressure.

FIBER D: The name given to a fiber which has a durable crimp that may be recovered even if temporarily altered during processing. Crimp gives bulk to the yarn and a wool-like appearance and hand to fabrics. Fiber D is used as pile yarn in rugs and carpets. Other uses include industrial fabrics, shoe fabrics, bathing suits, coatings, linings, knitted fabrics.

FIBER E: A new form of rayon, produced by E. I. Du Pont de Nemours & Co., Inc. The fiber has the property of curling or crinkling into a fuzzy, wool-like fiber when treated with a diluted solution of caustic soda. When combined with yarns of other fibers, it imparts a carved effect to brushed, cut, and loop-pile fabrics and produces a two-tone color effect from a single dye bath.



Right hand twill $\frac{2}{2}$.

FIBER RUG: An inexpensive rug made with twisted cotton warp and coarse thick filling yarn made from twisted strips of paper. Twisted grass is also used in some fiber rugs.

FIBERGLAS: Textile fibers and yarns produced from glass, which, when drawn fine enough, can be woven into strong, flexible fabrics. The raw materials that are used to make ordinary glass are refined and shaped into glass marbles which are remelted and formed into more than a hundred glass filaments, simultaneously attenuated into a single yarn of minute diameter. Glass yarns have been produced as fine as 100s cotton count.

Short, staple glass fibers, ranging from 8 to 15 inches in length, are produced by striking the streams of molten glass with jets of high-pressure air or steam. This process separates the filament where required, and seals the ends of the short staple. Short-staple glass yarns have a fuzzy surface, but the continuous filament produces yarns that are smooth.

Fiberglas is resistant to most chemicals and is insoluble in organic solvents. It is affected only by hydrochloric and phosphoric acids, and by weak, hot solutions or strong, cold solutions of alkalies. It is used for fireproof clothing and draperies, for electrical insulation, and for soundproofing. It is non-inflammable, non-absorbent, mothproof, mildewproof, and resistant to sunlight; it does not deteriorate with age.

FIBERGLAS AEROCOR: Made of superfine glass and about 30 times as fine as human hair, this product is lightly bonded into a fluffy blanket form for insulation, adapted for applications on the exterior of concealed ducts and for all ducts of a circular or elliptical cross section.

FIBERTHIN: Trademark of the United States Rubber Company for its base fiber used in the production of high tear-resistant, lightweight, coated fabrics which are made from nylon and rayon.

FIBESTOS: One of the first and best known of the thermoplastic molding compounds. These cellulose acetate formulations produce articles which possess a high impact strength, excellent wear-resistance, a high degree of rigidity and toughness, and fairly good dimensional stability. There are over 70 standard Fibestos formulations and any one of these can be further varied to fill some specific need.

Outstanding properties include adaptability to extrusion or economical high-speed injection molding. Compression molding may be resorted to where necessary. Fibestos may be used for costume jewelry, instrument and radio panels, tool handles, cases, toilet articles, etc. The compounds are available in transparent, translucent, and opaque colors over the entire range of the spectrum, including mottles and configurations.

FIBRO: This is the tradename for viscose rayon staple made by Courtaulds, Limited, England. It is supplied in a wide range of deniers and lengths.

FIBROCETA: This is the name used by Courtaulds, Ltd., England, for their acetate staple fiber.

FIBROLANE: It is the registered trademark under which Courtaulds, Ltd., England, sell their regenerated protein fiber which was first produced on a commercial scale in 1937. This casein fiber has the advantage of giving a fiber of excellent color which may be used in the production of white or pastel colored finished goods. The casein is dispersed in an alkali medium and then extruded into an acid coagulating bath. Subsequent stretching, hardening, and insolubilizing processes strengthen the fibers and impart to them a good extensibility and resistance to acid dye liquors.

FILAMATIC: Term used by American Viscose Corporation to describe their high-speed continuous automatic process for spinning rayon filament textile yarns.

FILAMENT: An individual strand that is of indefinite length. Examples are silk, which may run from 300 to 1400, 1600, and even 1800 yards in length; man-made and synthetic filaments which may attain a total length of several miles. A filament is the smallest unit in any type of cloth.

FILAMENT COUNT: The number of individual fibers or filaments actually counted in silk, synthetic, or man-made fibers or filaments. The number of filaments has direct influence on the softness, strength, pliability, and hand of the finished fabric.

FILAMENT RAYON YARN: Rayon yarn composed of a number of fine, continuous rayon filaments grouped together and usually given a slight twist.

FILENZA: American Viscose Corporation rayon yarn that is semi-dull in luster.

FILLING SATEEN: Cotton cloth made with a filling-effect satin weave on the face of the fabric.

FILTER CLOTH: A warp-effect, twill weave fabric which varies much in weave, yarn count, texture, and weight. Finds much use in industry in the food, candy, paint, chemical, petroleum, and similar industries.

FLANNELETTE: A lightweight cotton flannel made in stripes, plaids, and plain printed effects to distinguish it from domet. Soft spun filling is used to insured good nap on the cloth; however, in the cheaper qualities the nap comes off in a short time. Flannelette is easy to manipulate and it launders well. Used for pajamas, clothing, nightgowns, pocket lining, quilting, and shirting.

FLAT CHAFER FABRIC: Made with coarse single

yarn in the warp and filling and similar to regular chafer fabric.

FLAT DUCK: Light to medium weight cotton duck made with single warp yarn which is sized prior to weaving. Two ends are drawn as one through the heddle eyes and four ends are drawn through the reed split in reeding-in. Fabric is woven in plain weave. The filling may be single or ply and is referred to as single filling or double filling. There are many more ends than picks in the texture. Uses include clothing duck, enameling duck, wagon cover duck, and certain army equipage. Also known as flat ounce duck.

FLAX, LINEN: An important type of bast fiber, the plant is called the flax plant and the product is called linen. Flax is obtained from the plant stalk which grows in many world areas. It is the oldest textile fiber known in the vegetable group and it may attain a length of about forty inches. The name of the plant is *Linum Usitatissimum.*

The plant is raised for two purposes, the fiber and the seed. The latter is known commercially as linseed and it is used as linseed meal for animal feed, for birdseed, and in cake form in the chemical industry.

The fibers are manipulated into yarn and cloth, and the fabric is used for tablecloths, napkins, doilies, runners, crash, toweling, suiting material, twine, canvas, aprons, shoe thread, fishing tackle and nets, cigarette paper, currency and bank note paper, and similar products.

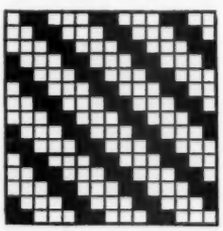
The chief flax producing countries are Russia, which supplies seventy-five percent of the world output; Belgium, which raises the best flax in the world; Ireland, where the best workmanship is found; The United States, Holland, South Africa, France, India, Japan, China and Asia Minor.

In this country, Oregon is the leader for fiber and seed, while Michigan, Minnesota, Wisconsin, Washington and Kentucky are interested mainly in the seed.

Fiber flax is sown about 85 to 100 pounds to the acre. The straws grow straight to a height of 30 to 40 inches. The seed branches are seen at the top only. The Oregon fiber is high in quality and compares favorably with the well-known Belgian thread fiber known as Courtrai stock.

FLESHER: The suede-like finished flesh-side or undercut of a sheepskin, split prior to tanning. (See Chamois.)

FLOAT IN WOVEN CLOTH: The part of a warp or filling yarn that does not interlace or extend over two or more warp ends or filling picks in a woven piece of fabric.



Left hand twill $\frac{2}{3}$.

FLOCKING FABRIC BY SPRAY METHOD: Viscose rayon staple may be flocked onto fabric, leather, cardboard, etc., to give plush, suede, velvet, and similar pile effects.

The short staple fiber may be applied to an adhesive backing either by spray or by an electrostatic plan. The spray method uses compressed air much on the order of spraying paint. In the electrostatic method the fibers are drawn by an electromagnetic set-up onto a resin-treated surface. Suedes are developed from an 0.5 millimeter length of fiber, while velvet is simulated from a length of 1 millimeter, and plush from a 1.5 millimeter length.

FOOTBALL LEATHER: Originally this was a pigskin leather but it has been replaced by an embossed or printed cattlehide leather; sheepskin has also been used to make this product.

FORMALDEHYDE TANNAGE: A method of tanning of the same type as oil tanning, and used for approximately the same types of leather.

FORTICEL: A satin-surfaced, fast-moulding thermoplastic produced by the Celanese Corporation of America. Features of the plastic include great toughness with lightness, low moisture expansion, and unlimited colorability. Moulded surfaces require little or no finishing.

FORTISAN: Registered trade name for a particularly strong yarn developed by Celanese Corporation. It is made by subjecting suitable cellulose acetate yarn to mechanical treatment to obtain a parallel molecular structure, then to saponification for a regenerated cellulose yarn, which is chemically similar to cotton. Uses include parachutes, core threads for tinsel conductors, sewing thread, shroud lines, high-strength coated fabrics.

FORTRON: A material made with a layer of Fiberglas fabric between sheets of vinyl film, laminated under heat and pressure to form a single sheet. Properties include strength, nonabsorbency, proofing against mildew and fungus, and resistance to acid, flame, and grease. Fortron will not stretch or shrink and will not crack at temperatures ranging to 30 degrees below zero. Colored and translucent types of the product are made at present. A product of Thermoplastics Fabrics Corporation.

FRENCH KID, FRENCH KID FINISH: The original *French Kid* was made in France and, because of its distinctive finish, the term began to be applied to a special class of leathers made in other countries. The present meaning is that of leather tanned from kidskin by the alum or vegetable process.

FRIEZETTE, FRISETTE: The diminutive *ette* seemingly indicates this to be a smaller replica of a frisé. A friezette, however, is made on a flat weave, and in order to obtain the imitation of a frisé, a rep weave is used so that when the fabric is woven, small ridges or hills are formed on the order of corduroy. It has a cut pile and is used in the upholstery trade.

FRONT: This term is applied to horse hides to distinguish the forepart of the hide from the butt or hind portion. A half-front is about a third of the entire area of the hide, and the whole front is about two-thirds of the area.

FULL GAUZE: The name given to cloth of a leno weave, particularly when the crossing of the skeleton threads is plainly seen where they come in contact with the base threads of the cloth.

FURNITURE DENIM: Broad term for solid color drill or plain weave fabric for chair covers, furniture, etc. Some furniture, however, is covered with denim or other fabric closely resembling it.

FURNITURE PLUSH: Made of all cotton or of cotton ground construction and mohair pile yarn, it is a plush used for upholstering chairs and other articles of furniture. Also known as Utrecht plush.

FURNITURE TWILL: Printed cretonne used in the furniture and upholstery trade.

FUSED COLLARS: Especially prepared interlinings, often made of acetate yarns, which are fused to the outer and the inner layers of the collar after high temperature is applied. The fusing tends to keep the collar in shape.

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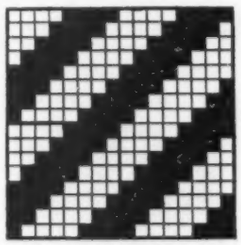
GALATEA: Cotton fabric made with a small left-hand twill weave and occasionally with plain weave. It comes in white, plain colors, or stripes and is given a harsh, lustrous finish. This rugged material is used for nurses' uniform cloth, children's clothing, middy blouses, kindergarten fabric, and linings.

GANTRON: This fabric receives its energy from the ultra-violet rays of daylight and is very bright under normal daylight conditions. It is purported to be twice as bright as ordinary textiles under normal daylight conditions, and up to ten times more discernible at dusk or under overcast skies. Gantron will dry instantly since it has non-absorbent properties.



Right hand twill $\frac{4}{4}$.

GAUZE: Made of several types of construction, 30s yarn is often used for the typical cloth. Textures vary considerably depending upon the ultimate use. The warp in gauze is carefully sized, then de-sized so that total absorbency is obtained without entailing loss of weaving production. This plain weave, lightweight cloth finds use in bandages, sanitary goods, surgical dressings, etc. Fine gauze is made of 60s yarn and has about the same uses as ordinary gauze. One of the chief uses is for tea-bags.

GAUZE WEAVE: Open work weave of porous nature made on the principle of plain weave. Leno or doupe weaving aids in securing gauze effects. There are also imitation gauze weaves used to bring out a design; marquisette, scrim, curtaining material and lace are examples of the weave.

GEAR DUCK: Any duck molded with bakelite and used in the manufacture of composition gears. Army, flat, or number duck may be used depending on the specifications at hand.

GLANTZSTOFF: The name usually given to rayon yarn of the Vereinigte Glantzstoff Fabriken, the original basis for Bemberg yarn.

GLASS: Obtained by melting certain oxides, combinations of oxides, or other substances that yield oxides on thermal decomposition, and so cooling that it is impossible for crystallization to develop.

GLASS TEXTILE: Glass that is in a suitable form for spinning or weaving. It comes in continuous filament or staple fiber form.

GLAZED FINISH: A stiff, highly polished finish given to chintz, some bookbinding fabric, and kindred materials. The cloth is subjected to a starch-and-gum treatment followed by a calender or a friction-calender treatment. The finish is not always permanent. In the leather trade, it is produced by polishing the grain surface of the leather with a roller of agate, glass, or steel. The finish can also be obtained by the use of a shellac or varnish coating.

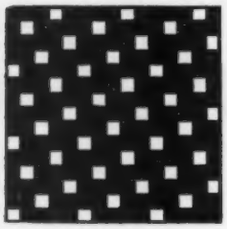
GLAZED KID, GLACE KID: A leather that is a product of goat and kid skins, chrome-tanned, in either black or colors.

GLOVE LEATHER: 1. The leather that is used for industrial or work-gloves and made from a variety of hides and skins, the most important of which are horsehides, cattlehide splits, calfskins, sheepskins, and pigskins. 2. The leather employed for dress gloves. It is tanned mainly from sheep and lamb skins and to a lesser degree from deerskins. Kidskins and pigskins are much used in making several types of gloves.

(continued)

GLOVE LEATHERS: These include the following:

1. *Kid:* The term commonly applied to grain glove leathers from goat or lambskins of wool or hair types. The name clings to the product merely in a popular sense and is not used by manufacturers except for stock actually made of immature goatskins. The term *Cape* is also used to designate one kind of kid gloves. In the glove industry goatskin leather is usually known as *real kid.*
2. *Napa Leather:* This is a sheep or lambskin leather that is made with a chrome, alum, or combination tannage, and drum-colored. It is made from South American or New Zealand sheepskins.
3. *Mocha Leather:* A leather that is obtained from sheepskins with a frized finish on the grain side so that both surfaces have a suede or ooze finish.



Satin — warp-effect
Five-end satin
Base of two.

4. *Pigskin Leather:* In the glove trade this leather comes from the skins of carpinchos and peccaries, and is chrome tanned. It is tough, durable and suitable for fine dress gloves, and sportswear gloves. A little of this leather is formaldehyde-tanned for white dress gloves. When chrome tanned, it is a rich yellow colored leather.
5. *Peccary:* A pig leather that comes from the wild boar in Central and South American countries. Argentine and Brazil are important sources for this leather. It is fine grained and can be shaved down to a very light weight, thereby making it desirable for ladies' fine dress and sports gloves. It is usually chrome tanned, is washable and particularly durable.
6. *Carpincho:* This comes from a water rodent peculiar to Argentina and Uruguay. The leather is heavier than peccary and its chief use is in men's fine dress and sports gloves. Carpincho is usually chrome tanned and is washable. In classification, it is a pigskin type of leather.

GRAIN: The outer or the hair-side of hide or skin where it is split into two or more thicknesses.

GRASSERS: Shelly, starved, rough-necked, thin calfskins or kips.

GRAY GOODS: Also spelled grey, greige. They are cloths, irrespective of color, that have been woven in a loom, but have received no dry or wet finishing operations. Gray goods are taken to the perch for the chalk-marking of all defects, no matter how small. These blemishes must be remedied in finishing of the cloth. Material is converted after weaving from the gray goods condition to the finished state.

Dry finishing operations may include perching, measuring, burling, specking, mending, sewing, experienced sewing; shearing, napping, gigging, pressing, packing, wrapping, and so on.

Wet finishing operations may include dyeing, printing, washing, fulling, milling, scouring, soaping, shrinking, crabbing, tentering, sponging, decating, London shrinking, waterproofing, mercerizing, gassing or singeing; beetling, chasing, schreinerizing, embossing, bleaching, sizing, calendering, friction calendering, Sanforizing, etc.

GREYS, GREY CLOTH, GRAYS, GRAY CLOTH: Cotton cloths which contain unbleached yarn whether made of plain or fancy constructions.

GUN METAL: The dull finish of the shade of gun metal on leather. It is brighter than the so-called mat finish on leather.

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HAMMOCK CLOTH: This leno-woven cloth is made from about 8/3s cotton yarn, both ways. The best grades of the cloth have from 16 to 20 ends per inch with filling texture of 12 to 16. Some lower textures average about 8 x 6. Fancy weaves and effects feature the material.

HANK: A unit of length used to determine a yarn number or yarn count.

HARNESS LEATHER: A term that includes collar and saddlery leathers. It is usually made of cattlehide that is oak or union tanned, except for the considerable use of pigskins for saddle seats.

HARVESTER DUCK: A particular type of number duck that comes in a variety of widths made to suit some special purpose. Used chiefly for conveyor belting on farm machinery.

HEAD: That part of a hide which is cut off at the flare into the shoulder.

HEALD YARN: A smooth, even, and very uniform Egyptian cotton yarn which ranges from 40s to 60s in the carded type and from 70s and higher in the combed type. The yarn is plied 4, 5, or 6 times and three or four of these plies are further folded or plied to give from 12- to 24-ply finished. Counts range from a low of 16/40s or 12/50s to a high of 12/100s or 16/90s.

HELANCA: A recent development of nylon yarn which has the power to stretch as much as five times its length. Micro-photographs of the yarn show the nylon expanded into a string of soft filaments that curl in all directions. Pulled tight, it condenses into a strong solid line. Relaxed, it returns to its curls. The process uses two yarns, one highly twisted to the right and one to the left. Combined, one counterbalances the twisting tendency of the other. Any size filament yarn can be used. The first adaptation of this yarn was in France and Switzerland for use in men's socks and in gloves, which are now available in this country. Helanca is a product of Heberlein and Company of Switzerland.

HEMP: This is found in the Philippines, Spain, Italy, Russia, Poland and India. Russia produces more than all the other nations combined. The best quality comes from Italy. Hemp is grown in this country in the states of Kentucky, Illinois, Missouri, Indiana, and California. In recent years Wisconsin has begun raising the fiber and excellent results have been obtained due to the mineral matter in the soil.

The fiber is difficult to bleach, a serious drawback to its progress. Like jute, the fiber comes from just inside the outer bark of the plant which grows from six to ten feet high. Hemp is stronger than jute and withstands water better than any other textile fiber. Uses of hemp are ropes, twines, cables, and rugs.

HENEQUIN AND SISAL: These closely related plants are found in Mexico, chiefly in Yucatan. Fibers are obtained from the leaves and henequin far outstrips sisal in the Mexican belt with regard to production and use. Sisal, however, is raised in British East Africa and in the Dutch Indies; it comes from the same family group as the century plant and belongs to the agave species.

Henequin and sisal are rather easily obtained from the plant and both are ideal in the manufacture of rope. Salt water, however, will quickly destroy the fiber, thereby limiting its use for maritime purposes. Binder twine, small diameter rope, and some hard-fiber twine are other uses of these two fibers. The binder twine is a favorite with workers in the grain fields since it is ideal for bundling and tying.

HESSIAN: Used for sacking purposes, it is a rough, coarse material made from the major bast fibers, alone or in combination.

HICKORY STRIPES: Cloth on the order of ticking but inferior in quality, lower in texture, and softer in feel. This rugged cloth is used in farmwork, industry, and for cheap clothing. Twill weaves are used to make the goods.

HIDE: When used to describe tanned leather, it refers to a pelt taken from one of the larger animals, such as cattle, in its entirety, and contains the whole superficial area of the covering of the animal from which it was taken.

HIGH-TENACITY YARNS: These yarns have been developed for purposes where extra strength is necessary. They are used chiefly in tire fabric, but have been used to make tackle twill and similar specially durable fabrics required for military purposes. High-tenacity yarns are made on the viscose system.

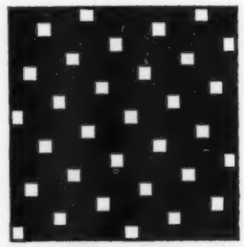
HOLLAND: 1. Cotton cloth that is given a glazed or unglazed finish with some softener and filling material treatments to make it opaque. This plain woven material is an imitation of the old-time linen that was given a beetled finish. Used for window and shade cloth.
2. An unbleached glazed or dull-finish linen, made chiefly in Holland for furniture covering.
3. General term for imported European linens.

HOLLAND FINISH: A glazed or unglazed finish given to certain cotton materials to make them more or less opaque. An oil and a filling material are applied to the cloth which is then given a thorough calendering. Uses include curtain or shade fabric, tags, sign cloth, etc.

HOP BAGGING OR POCKETING: 1. A jute bagging on the order of a tarpaulin, used for packing hops and similar products.
2. A four-leaf twill-woven jute fabric which weighs from thirty-four to thirty-eight ounces in a 48-inch width. Made in England and shipped to all parts of the world.

HOSE DUCK: A soft and pliable open weave, wide number duck of about 40 inches which runs from 10 to 24 ounces in weight. Used for hose, filter cloth, etc.

HOSPITAL GAUZE: Cheesecloth which has been sterilized for hospital use.



Satin — warp-effect
Eight-end satin
Base of three.

HUBBARD CLOTH: Registered trademark of the Joseph D. Shakow Company for a strong, lightweight, water-repellent cotton fabric which finds much use in rainwear.

HUSH CLOTH: Same as molleton or silence cloth.

HUSKING CLOTH: Cotton ticking used for work gloves and mittens.

HYCAR LATEX: This may be used as a coating or impregnant for materials. The product has high resistance to oils, abrasion, flexing, and chemicals. Hycar-treated fabrics may be coated with any one of a number of other materials to impart additional properties. Vulcanization is not necessary in any processing. Normal drying periods apply,

and no expensive solvents need be handled. Product of B. F. Goodrich Chemical Co.

HYDRAULIC LEATHER: A collective term often used for cattlehide leathers, processed by oak, chrome, and combination tannages, and used for pump valves, piston packings, and so on.

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IMITATION LEATHER: Drill, duck, sateen, sheeting, and kindred cotton fabrics coated with rubber, pyroxylin, or similar agents, to simulate leather. Embossing the goods gives them the appearance of alligator, pigskin, etc. This product is much used for lower priced luggage and bags.

INDIANA CLOTH: A combed cotton lawncloth that is given a water-repellent treatment so that it can be used in rubberized fabrics.

INDIA-TANNED: Applies to hides and skins tanned in India. The leather is considered as a semi-tanned raw material and is usually re-tanned in this country before it is finished.

IN-THE-GRAY: Goods as they come from the loom in the unbleached condition. Also known as gray goods, the term is practically confined to cotton materials from the loom.

IN-THE-ROUGH, IN-THE-CRUST, IN-THE-WHITE, IN-THE-BLUE: A group of terms that describe stock which has been tanned but not finished. *In-the-rough* or *rough-tanned* is commonly applied to vegetable-tanned cattlehide leathers. *In-the-crust* and *in-the-white* are used in reference to vegetable, alum, or formaldehyde-tanned sheep and lamb skins. *In-the-blue* refers to chrome-tanned skins.

In-the-white also means *in-the-pickle.* These more or less equivalent meanings are used to describe stock which has undergone the process prior to tanning, but not yet actually tanned.

IRISH DUCK: A plain woven, very strong, all-linen fabric used for overalls, engineers' clothing, and other work clothes.

ISTLE, IXTLE: Also called Tampico or Mexican fiber, little attention has been given to raising it. This yellow fiber is hard, rugged, and exceptionally stiff. Finds use in brushes and twine, and in low grade sacks.

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JACKET, WOVEN OR FELT: Textile materials woven or pressed into tubular or sleeve form, ready for covering and shrinkage on a machine roll.

JAGANATH: This plain-woven cotton cloth is made from grey warp yarn and brown or white filling yarn. Known in the trade as *Mock Grandrelle*, the cloth is used for boot and shoe lining.

JEAN: A warp-effect cotton cloth on the order of drill but made with higher counts of yarn, higher textures, and a finer diagonal twill line. A 2-up and 1-down left-hand twill weave is used to make jean. The British jean cloth is a 1-up and 2-down filling-face fabric that is bleached or dyed for use as lining fabric.

There is also another fabric of this name, a cotton or worsted material made in small twill weave. It is a rugged fabric that is used in low-priced clothing, blouses and uniform fabric. The name comes from Genoa, and in the Renaissance the jean was the standard currency of this city state.

JUNGLE CLOTH: Trade name for the strong, heavy but compactly woven cotton cloths made for the U.S. Navy. Woven with about 300 picks to the inch, the fabric gives good results in wind-swept, frigid areas.

JUTE: This bast fiber comes from the species known as Corchorous Capsullaris. Bengal and other parts of India, southern Asia and tropical Africa are the centers where the fiber is raised. Bengal is the world market center. The plant grows from two to twelve feet in height and the fiber layer is quite thick. The stalk produces two to five times as much fiber as the flax plant.

The plants are rippled and retted like flax. Stream retting is the most popular treatment and it takes from three to four days to complete it. Scutching and hackling treatments are also given to the fiber.

Jute spins well and is a cheap fiber. The great disadvantage to the fiber is that water and moisture disintegrate it. When dry, jute is durable. The fiber is not very strong and much difficulty is encountered in bleaching it.

JUTE RUG BACKING: Made chiefly in England and this country, this single construction jute material is made with plain weave, and has stripes that are composed of two colors in a three-thread arrangement in each stripe. Used as rug backing.

JUTE SCRIM: An English material made with an open mesh plain weave. It is used for baling or bagging vegetables for market and can be used in making tarred paper waterproof.

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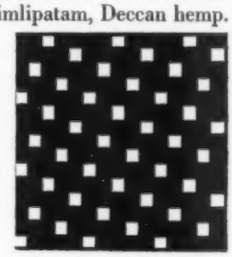
KAPOK: Found in Borneo, Java, Sumatra, and Central America, it resembles cotton in some respects and seems to have the characteristics of silk in feel and smoothness. Kapok has been called the cotton-silk fiber despite the fact that, unlike cotton and silk, it is irregular, weak, transparent, and inconsistent. It is used for pillows, mattresses, and in upholstering furniture.

KENAF: A five-foot fiber is obtained from the bark of this bast fiber plant. Runs from light yellow to grey in cast and is used chiefly for cordage and twines. Sources are Africa and India. Other names used are Ambari, Da, Bimlipatam, Deccan hemp.



Satin — warp-effect
Five-end satin
Base of three.

KID: Commonly this term now refers to shoe upper leather tanned from goat or kid skins, and to glove leather tanned from goat and lambskins. (See French Kid, Glove Leather.)

KIP, KIPSKIN: Skin from an animal of the bovine species in size between a calf and a mature cow, weighing in the green-salted condition from 16 to 25 pounds. It also includes skins from calves which have grown larger than the size usually slaughtered for veal, and certain breeds of undersized cattle which may have reached maturity. The term is also used for a pack of 30 finished chamois skins.

KODAPAK: Trade name for Eastman's cellulose acetate product which comes in sheet, strip, or other forms. It is a thermoplastic cellulose ester sheet used for transparent containers, envelopes, window boxes, metalizing, advertising, and display items; lamination, electrical insulation, and many other applications.

KOHORN STAPLE FIBER: A rayon fiber which combines some of the properties and advantages of wool with low cost and the versatility of viscose rayon. The crimp is equal to that of wool and it is claimed to be stronger than wool in the dry state, and as strong as wool in the damp or wet condition. Fabrics may be 100 percent staple or blended with wool according to trade demands.

KOROSEAL: The name given to a group of plasticized vinyl resins whose development was based upon the discovery that polyvinyl chloride resin formed workable rubber-like materials when certain high-boiling point organic liquids were combined with it.

The chemical resistance of Koroseal is of primary importance in its use as an insulator on plating racks. It is also used as a coating for oil and gas pipe lines in corrosive soil, as tubing for piping chemicals, transparent beer tubing, acid resistant fabrics, gas resistant fabrics, gas masks, food containers, bottle seals, and all types of protective coatings. Its flexibility and shock absorbing properties are utilized in Koroseal sponge, gaskets, conveyor belting, and all types of molded articles, belt, suspenders, wallets, and luggage. The B. F. Goodrich Laboratories developed Koroseal, meaning a seal against corrosion.

KRAFTCORD: A tightly twisted yarn made from cellulose fiber of a tiliaceous plant. Used as backing yarn in carpet weaves as an alternate for cotton or jute yarns.

KRENE: The trademark of the National Carbon Company to identify their products made of plastics, such as aprons, plastic fabric, rainwear material, shower curtaining, and window curtains.

KURON: A one-way stretch elastic material which has no rubber threads, although rubber is used as the basic elastic element. Used in elastic for garters, pajamas, suspenders, and underwear.

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LABEL CLOTH: Heavily sized cotton fabric used for labels and tags.

LACE LEATHER: A form of rawhide leather from cattle hides that is used for lacing together sections of driving belts. It is often prepared with an alum and oil and some other combination tannage.

LACELON: A gossamer, lace-like plastic which is rain- and stain-proof and flame-resistant, and may be washed and ironed as any ordinary fabric. Because of its fragile, fresh, summery appearance, it is used for women's headgear. In soft pastels, it is used for rollers, off-the-face and picture hats, most of which are trimmed with ribbon, silk flowers, and tulle.

Other uses for this product of Minnesota Mining and Manufacturing Company, Inc., include costume decoration, lampshade trimming, place mats, gift wrapping. Comes in 3- and 5-inch widths.

LACING NUMBER: This is a number found on rayon wrappings as the rayon is sent to the throwster. It indicates the batch of spinning solution from which the yarn was spun. Thus, yarns with the same lacing number should be identical.

LACTOFIL: A Dutch fiber in which milk casein has been mixed with latex and glue.

LACTRON: Extruded rubber thread compounded from natural rubber latex in sizes suitable for textile applications.

LADDER TAPE: The stout cotton tape or banding used on Venetian blinds.

LAID FABRIC: Cloth which has no filling yarn in its construction. The warp ends are laid parallel and set into a binding material which holds the warp ends in place. Laid fabric yarn is treated and will rest on the cloth upon which it has been laid. Automobile tire fabric is an example.

LAID WARP: Synonymous with *taped ends.*

LAMINATED FABRIC: Laminate means to form into a layer form. The name implies that two or more layers of material have been joined or cemented together by fusing with plastic, glue, resin, or rubber. Collar fabric and many industrial and mechanical fabrics are made in this manner.

LAMP WICKING: Wicks for lamps are made by using a flat or tubular fabric composed of coarse, soft spun, loosely twisted cotton yarn.

LANATIN: A method of modifying the physical properties of bast fibers, such as cotton, ramie,

(continued)

jute, hemp, etc.; rayon, acetate and some other man-made filaments. Fibers thus treated are referred to, for example, as Lanatinized cotton, etc.

LANITAL: Trade name for the original protein fiber made from casein, produced in Italy.

LAP: Cotton wound in a lap form ready for further processing. Card lap is from 40 to 45 inches wide; sliver lap is ten inches wide; ribbon lap, 12 inches wide. Card lap will weigh around 40 pounds when reading for carding. Worsted top is often spoken of as lap in the mill. Fibers in lap form are easy to unwind and manipulate.

LARRIGAN LEATHER: The name for oil-tanned light hides used in moccasins.

LASTEX: An elastic yarn, consisting of extruded rubber thread core covered with wrappings of cotton, silk, rayon, or nylon. Made in a wide range of sizes, tensions and elongations for application in elastic fabrics by knitting, weaving, embroidery, stitching, and shirring. Practical for all types of textile products where elasticity is desired. Used extensively in brassieres, corsets, underwear, millinery, gloves, surgical and garterless hose, slip covers, linings, footwear, bathing suits, belts, suspenders, garters, support garments, and notions.

LASTING: Made of cotton or wool, or of both fibers, this strong, closely textured material finds use in bags, boots, linings, trouserings, etc. Plain, twill, or small dobby effects may be used in construction.

LATEX: The viscid, milky, complex emulsion of proteins, alkaloids, starches, resins, and other substances secreted by the cells of certain plants such as the milkweed, rubber tree, and poppy. The liquid extruded from the rubber tree, when the bark is cut, may be coagulated with lactic acid and compressed into sheets, or solidified into rubber.

LATIGO LEATHER: An alum-tanned cattlehide leather chiefly used for halters, cinches, etc.

LATON: A superfine elastic yarn consisting of low-twist, yarn-covered, fine size, extruded rubber thread. Made in fine sizes and soft tensions especially for slips, hosiery, underwear, linings, dresses, swim suits, and other articles of lightweight sheer fabrics.

LAUNDRY DUCK: Wide army duck used to cover rollers on mangles and other laundry equipment. Comes in widths of 72, 81, and 90 inches.

LAUNDRY NETTING: Ply or cable yarns are used to make this strong, plain, or doup woven open-mesh cotton netting or bagging. Used in dye plants, laundries, etc.

LAUNDRY TRADE SHEETING: Coarse yarns, single 10s to 15s, are used in this sheeting of about 58-square in pick count or texture. Closely woven and rather heavy as to weight, it is used in hospitals, hotels, institutions, and schools.

LEAF OR HARD FIBERS: These are the rather stiff, elongated fibers from leaves or leaf stems, as in the case of abaca, henequin, sisal, istle, phormium.

LEATHER: The hide or skin of an animal, or any portion of such skin, when tanned, tawed, or otherwise dressed for use. In describing the classes of leather, the name of the animal from which the skin was taken is generally used. Thus, *cowhide, goatskin,* and other comparable names refer to the fact that the leather is actually made from the skins of those animals and should not be referred to otherwise without some explanation.

LEKTROSET PROCESS: A process of electronic twist setting for tire cord and other textile products owned by the Industrial Rayon Corporation of Cleveland, Ohio. Packages of the cord are passed through a high frequency electrical field to set the twist. The results show a uniform reaction in that cones containing as much as eighteen or more pounds of rayon tire cord may be effectively treated. Such giant cones are used in the fillingless method of tire construction. The process is completed in a very few minutes.

LEVANT LEATHER: Leather from the goat, sheep, and seal that is drawn in tannage into a grain pattern. Like *Morocco,* the name has come to define a pattern as well as original leather. The word, unless followed by the word *grain,* should be confined to leather from drawn goatskin. Embossed goatskin should properly be termed *Levant-grained goatskin.*

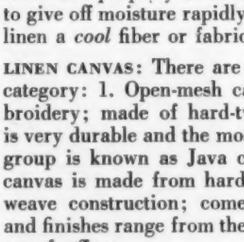
LIMBRICK: Plain woven cotton cloth made in England and used for curtaining. 64s warp and 30s filling are used in this plain weave fabric whose construction is 72 x 100.

LINEN: Flax, the raw material used to make linen fabric, is a fine, soft bast fiber obtained from the stalks of the plant by the process of retting. The fibers are silver grey, bluish grey, brown, or creamy white in color and from 12 to 40 inches long. Flax has a soft, silken-like luster and is a good conductor of heat.

Flax line and tow refer to the lengths of the fibers used in industry. Line fibers are those ten inches or more in length; tow fibers are shorter; naturally the line fibers are the more desirable.

There are several properties and characteristics of flax and linen that are important. Like cotton, linen is of vegetable origin and is classed as a dead fiber. The smoothness and lintlessness, however, of the fiber prevent the finished product from soiling as easily as many other fabrics. Flax is a coarse-pored fiber that takes up moisture rapidly thereby making it very absorbent in linen materials. The property of absorbency and its ability to give off moisture rapidly by evaporation makes linen a *cool* fiber or fabric.

LINEN CANVAS: There are several fabrics in this category: 1. Open-mesh canvas is used for embroidery; made of hard-twisted yarn, the cloth is very durable and the most popular cloth in this group is known as Java canvas. 2. Close-woven canvas is made from hard-twisted yarn in plain weave construction; comes in various weights, and finishes range from the heavily-sized varieties to soft effects.



Basket weave 4-4.

LINING FELT: Made of a composition of hair and asbestos, and often mixed with plaster of Paris, this product finds use in boiler and pipe insulation.

LINOLEUM: This floor covering is made from a burlap base. Oxidized linseed is mixed with ground cork and other pigments to give the composition which is rolled over the base. Linoleum comes in plain, printed or inlaid patterns. Plain linoleum has a single color face; the printed type has colored designs; inlaid has colored motifs which penetrate through to the burlap base.

LINT: 1. A good, workable fiber used to make yarn. In this sense, it is the staple cotton fiber which will withstand machine treatment. 2. Fly that floats around mill rooms during the manipulation of stock. Another use of the term signifies the minute fibers that cling to clothing, especially blue garments. 3. The waste from the cotton ginning process. This amounts to about one-third.

Lint should not be confused with linters.

LINTERS: The short, fuzzy cotton fibers which cover the seeds of certain types of cotton after the lint cotton or fiber has been removed at the cotton gin. Linters are very short, usually less than one-eighth of an inch, and they may be grey, greenish, or brown in color. One ton of cottonseed will yield over 200 pounds of linters. The production of linters is governed by the staple length of the fiber, the efficiency of the cotton gins and the types of other equipment used in the processing. About 30% of the total production taken from the seed is first-cut or first-time linters, while second cut linters provide the remaining 70%. First-cut linters, under normal conditions, sell for around 15 to 18 cents per pound; second-cut linters are about four cents per pound less in price. Linters are used in the manufacture of gun cotton, the stuffing in upholstery, absorbent cotton, mattresses, and the manufacture of pure cellulose sheets in the making of rayon and acetate rayon.

LOADING: Otherwise known in the leather trade as filling or stuffing, the use of the term really means that the filling or stuffing has been carried to excess, to increase the weight of leather.

LOOM AND WEAVING: A loom is a machine, hand or power driven, necessary to weave cloth. It consists essentially of parts that make it possible to have two systems of thread or yarn, called warp and filling, weave or interlace at right angles to each other. The earliest looms of which we have knowledge provided a means of hanging one set of threads in a vertical position through which the crossing threads were interlaced. Apparently, the first improvement consisted of a means to tighten these threads, either by hanging weights at the bottom end or by joining their two ends in such a way so as to form a loop over horizontal, parallel bars.

The following terms used in weaving parlance are synonymous: 1. Warp and end — the vertical or lengthwise yarns in woven cloth. 2. Filling and pick — the crosswise yarns in woven cloth.

Horizontal looms were used by the early Egyptians and other civilizations in early world history. In the simplest form, this type of loom provided for the tethering of a bar that carried the lengthwise warp ends to a stake in the ground. A bar at the farther end was secured to the person of the weaver, who had a straight set of warp threads through which it was possible to cross or interlace the filling yarns.

Primitive weavers improvised from simple materials a plain device or arrangement called a heddle or heald. This device enabled the alternate warp threads to be raised. Thus a shed was formed — an opening between the raised and un-raised or lowered threads or groups, through which the filling picks could be more easily passed.

At an uncertain date prior to the Middle Ages, some tribes, in what is now Great Britain, improved the apparatus by adding a frame — a warp beam. This beam was used to hold the warp ends and another beam was installed to take care of the woven cloth as it came from the loom, the cloth beam or roller.

The power loom of today is substantially the hand loom adapted to rotary driving. The frame is iron instead of wood; the sley or oscillating frame is pivoted below and driven by a crank; and the picking arm is actuated by a cone that turns on a vertical rod. The lift of the heddle shafts is controlled by tappets or cams. The motions are timed accurately in order to give a high rate of speed and production. The weaver, free from supplying power, has merely to apply the filling threads to the shuttle.

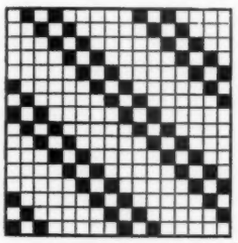
Major types of looms in use today:

1. *Automatic Loom:* Built for simple or plain weaving of cloth with the addition of an automatic

shuttle device to change the filling as it runs out. This type of loom makes for production. The machine does not stop while the new filling bobbin is set in to replace the one that has just run out. With suitable organization of labor, one weaver may take care of several of these looms. He may care for as many as 48 or more looms at one time.

2. *Looms for fancy weaving:* Have parts that are additional to those found on plain looms. Stripes of color are arranged for in the warping, but the crossing stripes to form checks and plaids are put into the cloth by the filling bobbin in the shuttle. There must be as many shuttles as there are colors of filling to be used in the cloth design. The shuttles are placed in boxes at the end of the sley or warp, and the mechanism provides that the particular box shall be in position at the instant or exact time required.

3. *Dobby Loom:* Weaves fancy materials. The dobby loom is built so that it can take care of many harnesses. Some looms have from 24 to 30 frames in them. The particular heddles on some



Left hand twill

$$\frac{1\ 1}{1\ 5}$$

filling-effect twill.

one harness can be lifted at a given moment by means of metal projections that engage the holes in strips or bars of metal plates that are successively present in endless chain form. This is called the draft chain or pattern chain.

4. *Double Cylinder Dobby Loom:* If it is desired to weave a pattern that contains a great many picks in the repeat, a large number of bars must be built for the pattern picks since, even on the double index dobby, one bar represents only two picks. When patterns of several hundred picks are woven, this becomes a matter of considerable importance as a long chain always requires much time in building.

To overcome the difficulty of building long pattern chains, the double cylinder dobby is largely used. The pattern chain for one weave is placed on one of the cylinders while the pattern chain for the other weave is placed on the second cylinder. Since it is possible to send either cylinder around as many times as there are repeats of the weave before changing onto the other cylinder, it is possible to build only one repeat for each weave, providing that the number of bars in one repeat is sufficient to go around the cylinder; if the repeat has fewer bars, a sufficient number of repeats must be built to encircle the cylinder.

Dobby motions are built with a capacity from 16 to 24 up to 30 harnesses. The 16-harness motions are used the most, whereas 20 and 30 harness motions are used for the more complicated weaves and novelty effects.

5. *Jacquard Loom:* Provides for the lifting or raising of individual warp ends without reference to adjacent warp threads. The loom is a development of the power loom. In the Jacquard head motion there are perforated cards and the needles of the cylinder in this head stock select the required warp end or group of ends. They raise these ends, which are lifted by means of hooks and form the top part of the shed of the warp in order to admit the passage of the filling pick through the opening formed.

6. *Other Types of Looms For Special Work:* Outstanding types are:

A. *Leno or Doup Loom:* Weaves cloth in such a way that certain warp threads twist or cross half way around or over other warp ends. There are two sets of harnesses used, standard and skeleton. This loom is used for marquisette, curtains, draperies, novelty, and fancy perforated effects in cloth.

B. *Lappet Loom:* Uses an extra warp to produce small fancy effects in cloth. There is a base warp, and a lappet warp takes care of placing the figured design in the material. Few of these looms are now in use.

C. *Swivel or Clip-Spot Loom:* Makes small designs or effects on cloth by means of an extra filling or swivel. The results are the same as those noted on a lappet loom. Few of these looms are now in use.

D. *Pile Fabric Loom:* Material from this type of loom is made with an extra set or sets of yarns that are looped on the face of the cloth. The fabric may be cut or uncut to give the pile effect. Cutting or looping is done by means of rods which, if they are tipped at the one end with a blade, will give a cut pile effect; if there is no blade at the one end of the wire, the material will become an uncut pile fabric. Plushes of all types are made on these looms.

E. *Indian Type Loom:* Also called the *inkle* or *belt* loom, provided with frames for loopers, tapestry, or upright looms in hand weaving.

LOOMS, CHIEF MOTIONS OF: There are six chief motions on a power loom. The principal motions are shedding, picking, beating-up; the auxiliary motions are take-up, let-off, pattern. The first three motions are linked together as follows:

1. *Shedding Motion:* The separating of the warp ends into an upper and lower system of threads to permit the shuttle to pass through the space that has been formed. The warp ends are drawn through heddle eyes in the correct manner and in the turning-over of the crank shaft of the loom, a shed is formed with each turn.

2. *Picking Motion:* The actual passing of the shuttle through the shed of the loom. The shuttle passes over the lowered ends of the shed and under its raised ends. The shed allows the shuttle to pass through it and thereby makes it possible for the shuttle to deposit the pick or filling yarn.

3. *Beating-Up:* The actual beating into place of the loose pick that was placed in the shed of the loom in the picking motion. Beating-up makes each and every deposited yarn a component part of the woven cloth. The reed beats this pick into place with each consecutive turn of the crankshaft.

The auxiliary motions are as follows:

1. *Take-Up Motion:* The motion is positive when the sand roller moves a fractional part of an inch in direct ratio to the take-up wheel. The motion is semi-positive when the sand roller is not definitely controlled.

2. *Let-Off Motion:* The motion is frictional when there is a definite amount of warp allowed to leave the warp beam according to the beating-up of the lay of the loom. It is positive when the lay and the let-off work in two ratios, taking up just as much as is let off.

3. *Pattern Motion:* Not found on all looms, but generally used on machines where more than one color is desired. It is found in the following ratios: A. From a 2 x 1 box loom to a 6 x 1 gingham loom. B. From a 2 x 2 box loom controlling three colors. C. From a 4 x 4 box loom controlling seven colors, pick and pick type.

While every effort has been made to give as complete a coverage as possible of the terms currently used in the field of industrial textiles and in related fields such as leather, such a list is necessarily incomplete. The terms given have been in most cases recently checked and where trade names are given they have been confined to those so widely used as to find a place in a reference glossary. For the convenience of readers who require more detailed information than has been given here, a list of reference sources has been included. On the next page is also a listing of the main types of fabrics used in a number of trades and industries which are large consumers of industrial textiles. For supplementary information the reader is referred to the issues of AMERICAN FABRICS *containing dictionaries and glossaries in special fields.*

LOOM FINISHED: Material sold in the same condition in which the goods came from the loom — duck, webbing, canvas, burlap, etc.

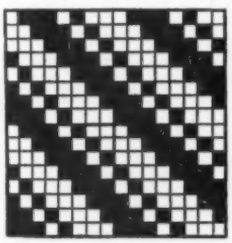
LUGGAGE CLOTH: Sometimes also called Transportation Fabric, this rather loosely applied term may imply cotton cloth which has been coated or treated on the one side with transparent pyroxylin finish. Any of the very simple weaves are used to give the effects which are often striped for identification purposes. Used for all types of luggage and casings, etc.

LUMARITH: This plastic is a transparent sheeting pliable enough to wrap a powder puff but rigid enough for shaping into a lunch box. It will not stretch or shrink, and is dust-proof and resistant to moisture. A cellulose acetate product of the Celanese Corporation of America.

Left hand twill

$$\frac{3\ 1}{1\ 3}$$

even-sided twill.



LUREX: A metallic yarn of plastic coated aluminum made for use in lamé fabrics. The yarn is composed of an aluminum base fiber sandwiched between two plies of specially formulated plastic film. Special processing and adhesives make the yarn impervious to tarnish, and also much lighter than ordinary metallic yarns. Lurex is used in evening wear fabrics, curtains, and millinery fabrics. Product of the Dobeckmun Company.

LUSTRON: A polystyrene which is made by a series of reactions, from organic chemicals, benzene, and ethylene, which are produced from coal and petroleum respectively. Lustron is the lightest of all plastics. It possesses excellent electrical properties and exceptional resistance to acids, alkalis and alcohols. Lustron has surface hardness and a limitless range of colors are used in the finished product. It has the ability to pipe light around corners. Lustron has dimensional stability, high heat distortion temperature, and unusual strength at low temperatures. This is a product of Monsanto Chemical Co.

To be concluded

INDUSTRIAL AND MECHANICAL FABRICS

For the Mechanical Rubber Trade:

- Army duck
- Balloon fabrics
- Belting duck
- Bootleg duck
- Chafer fabric
- Drills and twills, wide
- Enameling ducks
- Hose duck
- Lawncloths
- Leno or doup fabrics
- Napped fabrics
- Osnaburgs
- Sateens
- Sheeting, narrow and wide
- Tire fabrics

For the Rubber, Oilcloth and Pyroxylin Trade:

- Wide drills and twills
- Wide moleskins — chafers
- Wide printcloths
- Wide sateens and broken twills
- Wide sheeting

For the Shoe Trade:

- 37″ Army duck
- 37″ drills
- 37″ four-leaf twills
- Enameling duck
- 30″ Gem duck
- Leno or doup specialties

For the Use of Filtering Media—*Chemical and Paint Manufacturers, Oil Refiners, Soap Manufacturers, Sugar Refiners, etc.:*

- Chain cloths
- Duck
- Drills
- Twills

For the Laundry Supply Trade:

- Laundry apron ducks
- Laundry nets and tubing
- Roll cover duck
- Roll cover sheeting
- 36″— 3.50 Sheeting for Ironing Boards
- 40″— 3.15 Sheeting for Ironing Boards

For the Converting Trade:

- Army duck, waterproofed for various purposes
- Drills
- Enameling duck—38″ to 100″ inclusive
- Gabardine
- Moleskin
- Sateens
- Sheeting
- Single and double filling duck
- Twills
- Wagon cover duck
- Wide duck, waterproofed
- Printcloths

For the Tent and Awning Trade:

- Army duck
- Awning stripe
- Double filling duck
- Mineral khaki duck
- Numbered duck
- Single filling duck
- Tent twill
- Waterproof duck

For Specialty Manufacturers:

- Advertising specialties—duck, drill, printcloth, sheeting
- Fireproof material
- Golf bag duck
- Napped fabrics
- Vat dyed fabrics
- Window shades — sheeting, printcloth, enameling duck

For Dry Goods Jobbers and Chain Stores:

- Crash
- Denim
- Double filling duck
- Huck toweling
- Printcloth
- Single filling duck
- Turkish toweling
- Wide duck
- 30″— 2.50-2.85 drill

For Flag Manufacturers:

- Government type — all wool
- Navy type — all wool
- Commercial — all cotton
- Sheeting
- Single filling duck
- Printcloth
- 30″— 2.50 and 2.85 drill

For the Work-Clothing Trade:

- Army duck in plain and water repellent finish
- Bedford cord, gabardine, jean, moleskin, sateen, suede, suiting fabric
- Corduroys for men's wear and women's wear
- Express, hickory and fancy stripes
- Grey drill, duck, twill
- Indigo blue denim
- Khakis, drapery fabrics, drill, herringbone, jean, twill, upholstery fabric
- Single filling and double filling duck

Unbleached Sheeting — *in standard constructions:*

- 36″— 3.50 — 64 x 68
- 36″— 3.75 — 64 x 64
- 36″— 4.00 — 56 x 60
- 36″— 4.25 — 56 x 56
- 36″— 4.50 — 56 x 52
- 36″— 4.70 — 48 x 52
- 36″— 5.00 — 48 x 48
- 36″— 5.50 — 44 x 44
- 36″— 6.50 — 40 x 40
- 40″— 3.15 — 64 x 68
- 40″— 3.60 — 56 x 60

For Miscellaneous Industries:

- Abrasive Industry: Drill, jean, double filling duck
- Airplane and Balloon: Balloon fabric, wing fabric
- Army and Navy:
  - Boat Covers: Army duck, Numbered duck, paulins
  - Gun Covers: Army duck
  - Tents: Army duck, shelter tent duck
  - Wagon and Truck Covers: Numbered duck
- Automobile Industry, Headlinings: Broken twills, sateen, sheeting
- Bakelite and Synthetic Resins: Duck
- Buffing Wheel Manufacturers: Naught duck and sheeting
- Railroads: Cab curtains and ceilings for refrigerator (Cars use Numbered duck)
- Shipping Covers: Fabric to suit particular use
- Spring covers: Double filling duck
- Upholstery Padding: Sheeting

letters to the editor

DESIGN THEMES FROM MEXICO

To the Editors:

Under separate cover I am forwarding some pictures of designs on buildings recently excavated near Chichen Itza, in Yucatan. It is my feeling that in these, and similar Mayan design creations, there is material for stimulating modern creations in the fabric field. I have observed that AMERICAN FABRICS has published many inspirational items from the art collections dealing with Chinese, Japanese, Mogul, and Rajput themes, but nothing that I am aware of dealing with the rich material we have down here.

As you probably know, the early culture of Mexico is multi-layered, and each layer has its own symbolism and design forms. Particularly significant, in my opinion, and in the order named, are the designs of (1) the Mayan, (2) Zapotec, (3) Mixotec, and (4) Aztec periods. In the sculptured art of these cultures are to be found such colorful design figures as that of the Makara, a mythological beast, half crocodile, half elephant; the sun with hawk's wings; and a variety of forms of the plumed serpent — made famous by D. H. Lawrence. Many anthropologists believe that the resemblance of these to certain Old World animals is evidence that there was some interconnection between Mayapan and Egypt in times long past.

At any rate, whatever the cultural significance, I feel that the design elements in Mexican art are meaningful and applicable to many current trends. I would like to see some serious treatment of this field in your comprehensive journal.

Jose de Zayaga
Mexico City, Mexico

COTTON CONSUMPTION OF AUTOMOBILES

To the Editors:

On page 75 of the Winter 1952-53 issue, I read that automobiles are the largest consumer of cotton! Since my imagination will in no way show me how more cotton can go into automobiles than into bed sheets, I would appreciate further explanation.

Your magazine is invaluable to me as a mill man who tries to keep up with developments of industry-wide importance.

Edward Waller
Danville, Virginia

Editors' Note: Automobiles as a consumer of cotton fabrics was listed as one of the five largest consumers, along with sheets, shirts, trousers and bags. The reference was not intended to convey that automobiles headed the list.

A READER'S COMPLAINT

To the Editors:

Is there any excuse for a manufacturer of children's clothing to combine a small amount of material which fuses under a hot iron with cotton in a garment obviously designed for everyday wear? We have four boys (the oldest is ten) and *everyday wear* means frequent laundry. I am sending along a shoulder inside reinforcement from a cotton plaid shirt which my eight-year-old received as a Christmas gift. We have also had several knit shirts with an acetate ribbon covering the joining between the neckband and the shirt. It is particularly unsuitable to have a scratchy area at this part of a child's neck.

This is a photo of the shoulder reinforcement referred to in the accompanying letter.

I would be grateful to you if you could pass this complaint along. It has irritated me a good bit, especially because it seems so unnecessary and obviously ridiculous.

I have in the past done a little work in textiles, and also some handweaving. We subscribe to AMERICAN FABRICS for enjoyment, and all of us do enjoy it.

Mrs. H. M. Southworth
Alexandria, Va.

Each issue of AMERICAN FABRICS *brings you knowledge and information based on authenticity.*

PERTINENT COMMENTS

To the Editors:

A few comments on the Fall, 1952 issue of your publication:

For instance, the presentation of corduroy in rayon by Avisco is utterly charming and that of Lastex for the embellishment, or should I say confinement, of the form divine is bewitching. American Textile Company's showing of laces approaches the level of fine and serious art, whereas American Enka's color page features the All-American Girl at her best. Perhaps I should admit that I know someone who would become the Larry Aldrich dress even more than the model pictured on the page.

The article titled, *The Lure of Lace*, devoted to what the writer rightly styles "the aristocrat of fabrics," is superb and a contribution to anyone's education. I feel particularly indebted to you for affording me the opportunity to study the lace swatches which testify eloquently to the excellence of American design and craftsmanship. As an example of bookmaking AMERICAN FABRICS is outstanding and I congratulate you upon it.

Perhaps your editorial staff will be interested in an experience of mine one Sunday. It happened that I was stopping over in Pensacola, Florida to pay my respects to one of Uncle Sam's future admirals — meaning, my favorite member of the armed forces, who was in the midst of his navy pre-flight training. In the course of walking from the Hotel San Carlos to the Post Office, I saw in a show window this arresting card:

Fony
Fabrics
For
Fall

You will guess correctly that poodle cloth and other items of like nature were on display. Though the card was truth-telling, I questioned then and question yet the propriety of this approach to the trade.

H. Merle Smith
Chicago, Illinois

To increase volume and maintain profits, each issue of AMERICAN FABRICS *brings you valuable, authentic, and needed information.*

INTEREST IN JACQUARD

To the Editors:

This is to say how much I enjoyed the lace story in a recent issue of AMERICAN FABRICS. I have always been interested in this fabric, although, before reading this article, I had no way of learning about the techniques and ingenuity involved in the production of such an extraordinary fabric. I was particularly struck by the descriptions and illustrations of the Jacquard cards, and I would very much like to know more about how they came to be developed. Who was Jacquard? And how did he come to develop such an ingenious device? Do you think that, in some future issue, you could run an entire article on Jacquard and his inventions?

Roseann Potemkin
Ann Harbor, Michigan

Editors' Note: AMERICAN FABRICS *published a feature article on the history of Jacquard and the Jacquard machine in Issue No. 15, Autumn of 1950.*

MORE DESIGN SUGGESTION

To the Editors:

Your feature on African designs was wonderful. It reminds me of the story of the man who saw his first sun dial and said, "What will they think up next?"

The rediscovery of the old and the traditional is one of the things which makes the designing field such a fascinating area for research and integration, for although there is nothing new under the sun, everything old is really fresh and exciting when looked at in a new way. I hope some time soon you will find time to look into the fascinating designs of the northwest coast Indians, particularly those of the Dene and the Siwash. In this part of the world we have a heritage of design which, it seems to me, the fashion textile field has never probed.

Helen Hills Hetherington,
Walla Walla, Washington.

AMERICAN FABRICS *brings you advance news of what's coming up in the fashion-fabrics fields.*

A.F. FOR HISTORICAL PURPOSES

To the Editors:

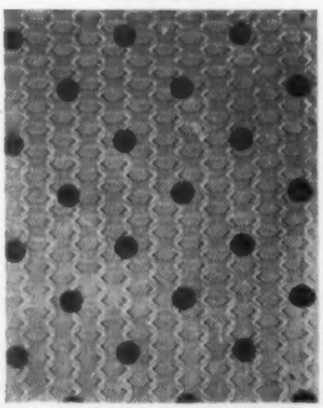
The copies of AMERICAN FABRICS are a delight. Not only are they of great importance to us at this time which is seeing the development of the synthetic fibers, but their value to those who will be in our shoes in the future is incalculable.

We are frequently baffled when cataloguing clothing of previous generations in our endeavors to attach the proper names to old fabrics. So many of them were colloquial and were lost when fashions changed.

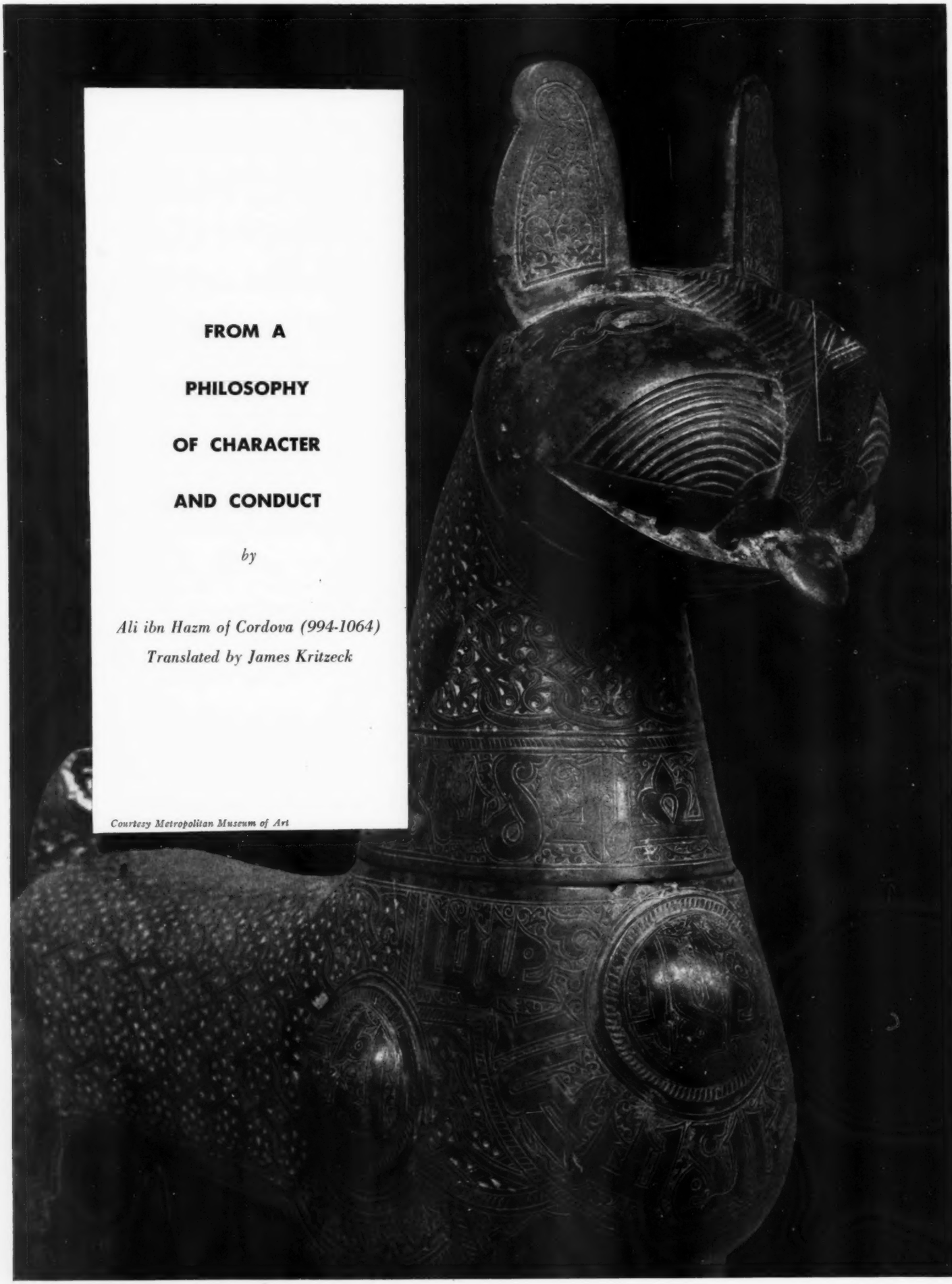
Please accept our grateful appreciation for your publication.

Mrs. John H. Cronly
Valentine Museum
Richmond, Va.

FROM ITALY



An example of an Everglaze textile styled and designed by the Italian firm of Tintoria Comense in Como, Italy.



FROM A PHILOSOPHY OF CHARACTER AND CONDUCT

by

Ali ibn Hazm of Cordova (994-1064)

Translated by James Kritzeck

Courtesy Metropolitan Museum of Art

I AM A MAN who has always been uneasy about the impermanency and constant instability of fortune. Concerns of this sort have occupied me during the greater part of my life, and I have preferred to spend it pursuing these matters studiously, rather than looking for delights of the senses or the accumulation of great wealth, which most seem to prefer. In this book I have gathered teachings suggested by experience in order that those into whose hands it should chance to fall may derive a little benefit from what has cost me so much of anguish and meditation.

IN MY INVESTIGATIONS I have constantly tried to discover an end in human actions which all men unanimously hold as good, and which they all seek. I have found only this: the one aim of escaping anxiety. I have not only discovered that all humanity considers this good and desirable, but also that notwithstanding the contradictory variety of opinions, designs, wishes, and purposes of men, no one is moved to act, or resolves to speak who does not hope by means of action or word to release anxiety and drive it from his spirit. Now it is clear that some err in their choice of the right path leading to this end; others deviate from it; still others, and they are always in minority, achieve it; yet escape from anxiety has always been the common purpose of men of all races and people since the world began, and will be until it ends. All their desires have their unique foundation in this purpose.

OTHER ENDS DO NOT seem to command the unanimous approbation of men. There are, for example, those who do not desire goodness, faith, or truth; there are those who prefer to satisfy their passions in a dark corner rather than to enoy fame's flatteries; there are those who do not desire riches but prefer to be poor, as do most philosophers and devout people; there are those who, as if by natural inclination, detest sensual delights and hold as imperfect those who crave them; there are many who prefer ignorance to knowledge. One must reckon these things among the ends of human actions. Still, no one considers anxiety to be a good thing; every man seeks release from it.

THOSE WHO CRAVE riches seek them only in order to drive the fear of poverty out of their spirit; others seek for glory to free themselves from the fear of being scorned; some seek sensual delights to escape the pain of privations; some seek knowledge to cast out the uncertainty of ignorance; others delight in hearing news and conversation because they seek by these means to dispel the sorrow of solitude and isolation. In brief: man eats, drinks, marries, watches, plays, lives under a roof, rides, walks, or remains still with the sole aim of driving out their contraries and, in general, all other anxieties.

YET EACH OF these actions is in turn an inescapable hotbed of new anxieties; unexpected obstacles to its realization raise difficulties according to the occasion . . . loss of what was gained, inability through misfortunes to reach a happy conclusion, unpleasant consequences which come with satisfaction, fear of competition, criticism of the jealous, theft by the covetous, aversion to seeing what we desire in the hands of an enemy, slanders, and the like.

AFTER GRASPING this sublime truth and comprehending this weighty secret, I sought to find a sure method of arriving at this end which all men alike, ignorant and learned, holy and wicked, seek and hold as good. I discovered that this method consists in nothing else but directing one's self towards a Supreme Goodness by means of good works conducive to immortal life.

FOR, AS I INVESTIGATED, I observed that all things tended to elude me, and I reached the conclusion that the only permanent reality possible consists in good works useful for another or for an immortal life. Every other hope that I desired to see realized was followed by melancholy, sometimes because what was ardently desired escaped me, sometimes because I decided to abandon it. It seemed to me that nothing escaped these dangers but good works directed by a Supreme Goodness. These alone were always followed by pleasure in the present and in the future: in the present because I was freed from numberless anxieties which disturbed my tranquility and, moreover, friends and enemies concurred in commending me; and in the future because they promised immortality.

THE GOOD WORK, one profitable for an immortal life, stands innocent of all defect, free of all imperfection, and is, moreover, a sure way to put aside every anxiety effectively. I have, indeed, observed that everyone who works for this end, even though he undergoes unpleasant tests on the road of life, not only is free of care, but rejoices, because the hope which he holds for the end of his present life helps him to seek what he longs for and incites him to follow in this direction, the end in which he believes. And if any obstacle stands in his way, I have likewise observed he had no anxiety about it, because as he has not consecrated himself to what he sought, he does not consider the obstacle as a punishment inflicted on him. I have seen, too, that if anyone damages him he is joyful, and if any calamity comes about he is no less happy; and more, if he experiences sorrow or weariness in what he has done, he is still full of joy. He lives, in point of fact, in constant unending joy, while quite the contrary holds for other men.

THE PLEASURE WHICH the intelligent man experiences in the exercise of his reason, the learned man in his study, the prudent man in his discreet deliberation, and the devout man in his ascetic combat are greater than the delight which is felt by the glutton in his eating, the toper in his drinking, the lecher in his incontinence, the trader in his gainful bargaining, the gamester in his merriment, and the leader in the exercise of his authority. The proof of this lies in the fact that intelligent, learned, prudent, and devout men also experience those other delights which I have just enumerated in the same way as one who lives only to wallow in them, but they tend to abandon and separate themselves from them, preferring instead the quest for permanent release from anxiety in the nature of good and virtuous works.

IT SEEMS UNWORTHY of a man to consecrate himself to something which is not higher than he is, that is to say, a Supreme Goodness. The intelligent person would account any lower price on himself as unworthy. Therefore, he will consecrate himself to good works, to leading his brothers to truth, to the defense of sacred things, to avoiding any despicable humiliation which is not imposed on men by necessity of nature, and to protecting victims of injustice. One who consecrates himself to lesser things is like one who trades a precious gem for a pebble.

DO NOT FORGET, then, that only one thing deserves to be sought by all men, and that is the absence of care; and the single road which leads to it is built of good works done for the sake of the Supreme Goodness. All else is a foolish waste of time.

SOME MEN WHO HAVE FOOLISHLY alienated themselves from a good and kind master to seek the services of so harsh and savage a lord as the world and its snares, who are all agog for present joys in which they are struck, who never think about the future, who are always grasping for bodily enjoyments, but allow their souls to grow thin, hungry, and worn with a myriad ills . . . these I consider are like the man flying before a rampant beast, who, unable to endure the sound of its cry and terrible bellowing, ran away at full speed, to avoid being devoured. But while running hastily, he fell into a great pit and, falling, he stretched out his hands and caught hold of a tree to which he held tightly.

* * *

THERE HE ESTABLISHED SOME sort of foothold and thought himself from that moment in peace and safety. But as he looked, he saw two mice, one white, the other black, ceaselessly gnawing the root of the tree to which he clung, and on the point of severing it. Then he looked to the bottom of the pit and saw a dragon, breathing fire, exceedingly fierce and grim, with terrible jaws wide open, all ready to swallow him. Again, looking closely at the ledge on which his feet were, he could see four heads of snakes projecting from the wall on which he was perched. Then he lifted up his eyes and saw a little honey dripping from the branches of the tree. Whereupon he ceased thinking of the troubles by which he was surrounded . . . how, outside, the beast was raging to devour him; how, down below, the fierce dragon was gaping to swallow him; how the tree which he clutched was all but severed; how his feet rested on slippery, treacherous ground. Indeed he forgot, carelessly, all those awesome and terrible sights, and his whole mind hung on the sweetness of that little drop of honey.

* * *

THIS IS A PORTRAIT of those who cling to the deceitfulness of this present life. The beast is death, ever in hot pursuit of the race of Adam. The pit is the world, full of every kind of illness and deadly snares. The tree, to which the man clung, which is being gnawed by the two mice, is the course of every man's life, hour by hour, day and night, gradually coming closer to its severance. The four snakes signify the construction of a man's body of four treacherous and unstable elements which, if thrown out of balance, bring the body to destruction. The fiery, cruel dragon signifies the devil, hungry to receive those who choose present pleasures rather than future blessings. The drop of honey denotes the sweetness of the delights of the world, which deceives its own friends and does not permit them to take timely steps for their salvation.

FROM BARLAAM AND ISASAPH, BY ST. JOHN DAMASCENE

THE CONSUMER

The millman, the converter, the apparel manufacturer, the retailer, the retail clerk . . . all constantly use textile words and phrases as selling blandishment . . . all assuming that Mrs. Consumer knows what they're talking about. Sadly enough, a good deal of it is incomprehensible to her. And so writer Cora Carlyle gathers a

Q. What is meant by *nylon stretch yarn* and what are some of its uses?

A. This yarn is made according to the new Helanca process. To describe the yarn and its use, it may be well to recall the ordinary manner in which rubber threads are used — spaced into a fabric so that the puckers of the goods occur between the rubber threads. When the garment is put on, the rubber stretches and the puckers flatten out for the garment to fit.

When *nylon stretch* is used, it replaces the old-time rubber or elastic yarns. The Helanca process has twisted and heat-set the yarn so that it stretches to five times its relaxed length. When released from tension it reverts to approximately its original length. Advantages of the yarn include greater durability; and its use in a garment allows for one size to fit many, as in the case of sweaters, gloves, and hosiery.

Q. I have a stole made of angora yarn. Is there any way to keep it from shedding? And how should it be cleaned?

A. Angora comes from the angora rabbit and is classed as a luxury fiber. It is luxurious not only because of its soft feel and its cost, but it must be handled with utmost care at all times. There is no way to stop or arrest the shedding of fibers from any garment which is all-angora or from one that contains a considerable percentage of the fiber. Many wearers, however, regard this disadvantage as negligible when the beauty, high style, and pleasant hand are considered.

As for the correct methods for cleaning articles made of angora, the National Institute of Cleaning and Dyeing informs us that angora or angora-trimmed garments must be dry cleaned and, in addition, should have careful, special handling. Because of the fiber's physical structure it will felt, that is, become harsh and hard with the slightest mechanical action in cleaning. Thus, entrust your angora articles only to a dependable dry cleaner.

Q. I have several blouses and lingerie pieces made of white nylon and am troubled by the fact that the white takes on a greyish or yellowish cast after a few washings. What can be done as a remedy?

A. A splendid survey on questions of this sort has just been made by the Bureau of Home Economics, Washington, D. C. A summary of the high points follows:

1. Launder white nylon fabrics separately from colored clothes since color may be picked up by the nylon.
2. The cast you note may have been caused by laundering with soap in hard water. You should, therefore, soak the garments in a solution of sodium hexametaphosphate, which will loosen the soap curds or cakes previously acquired. Your grocer will know about this and suggest one of the leading brands.
3. Wash the articles with soap in soft or softened water, or use a built-up synthetic detergent in soft or hard water. Your grocer will also know what is needed in this instance.
4. Rinse thoroughly in soft or softened water.
5. If need be, use a bleach or bluing. For the reduction of greyness, it should be noted that a chlorine bleach cannot be used unless followed by an antichlor rinse. A bleach which contains 44% sodium perborate is effective.

To reduce yellowness, use a final bluing rinse. This will mask the yellow cast and cause the nylon to come out white.

Q. What is the best way to remove a hair oil stain from fabric? Does any one method apply to all types of cloth?

A. Make a solution of equal parts of chloroform, benzol, and carbon tetrachloride. Sponge and then rub the area vigorously. This solution may be used on any type of fabric with good results practically assured.

Q. I am in a quandary about what to do with my rayon draperies, slip covers, children's dresses, and other items which seem to lose their crispness and newness after washing in the automatic machine. I cannot use starch because when the fabrics are dark in shade the starch shows up on the surface. Have you a suggestion?

A. Ordinary household gelatin may be used to restore rayon fabrics such as you describe. Soak the gelatin in cold water, then dissolve in boiling water and add enough cool water to dip the fabrics you wish to restore. The amount of gelatin to use depends on the yardage involved. For most rayon dresses, however, use two tablespoons of gelatin. Dip the garment into the mixture after the usual washing and rinsing.

Q. You have told your readers previously that "heat setting" of nylon lingerie prevented shrinkage and that the pleats will stay in, etc. What I would like to know is this — are ordinary runs in the knitted fabric of nylon "heat-set" prevented by the "heat-set treatment"?

A. The so-called "runs" in lingerie fabric of knitted nylon "heat-set" construction are entirely dependent upon the construction of the fabric. A two-bar tricot, for example, would be run-resistant, no matter what fiber was used, within reason, because the stitches are actually interlocked in the knitting process. A plain-knit nylon "heat-set" fabric would have the usual tendency to run.

Q. I have read with avid interest everything I could find on the new fiber Dacron. The ads are very glowing as to its excellent properties and characteristics. Yet, I cannot find any garments made of Dacron in my local stores in a fairly large city. After reading the ads, I had decided that Dacron would be the answer to what is a practical fabric for my daughters, who are hard on clothes.

A. A bulletin from the National Retail Dry Goods Association has announced that Dacron will be in short supply for women's garments for some time to come. Most of the current available supply has been allocated to the men's wear industry. By the spring of 1954, according to reports, there should be a considerable amount of Dacron in circulation.

WANTS TO KNOW...

group of typical Mrs. Consumers before each issue goes to press . . . asks them what they'd like clarified in textile terms . . . and puts the questions to Dr. George Linton, Textile Editor. Here is the latest group, and the answers may provide illuminating information for the benefit of many readers.

Q. I am a home sewer, and I realize that a bias cut is desirable to obtain a smooth fit, freedom of movement, and the necessary *give*. But how can I hold these bias cuts in place until they are fitted together and stitched on the machine? Too many times I have droops at the seams, especially with tricot fabric.

A. When you are joining any seam that is even slightly off the exact straight, we recommend applying cellophane tape to the edges as soon as they are cut. Thus, you can hold the exact shape. After stitching, the tape is easily ripped off, and the line of the seam is preserved intact.

Q. I bought a skirt made from one of the new synthetic fabrics. It was called *permanently pleated* and washable. When it was washed, the pleats remained but there was a change of shape at the side seams — a stretch of about two inches — and the skirt does not now hang evenly. What can be done about this?

A. This fault is caused by the garment maker and is not the fault of the fiber or the fabric finish. If the skirt was recommended as washable at the store where you bought it, we suggest that you consult the buyer of the particular department. It may be that the seams were not properly *stayed* in the stitching.

Q. Some time ago I asked if there was anything I could do to keep slips and dresses from clinging during wear. You informed me that the condition was caused by static electricity. I would now like to know if there has been anything done to overcome this problem.

A. This is one of the major problems which now absorbs the interest of textile manufacturers; not only because of the clinging, but also because the static attracts dust particles to the fabric. Some producers are now using detergents of various types to overcome the trouble. The results, as yet, are not fully conclusive, but announcements will be made as soon as effective elimination of the static condition is assured.

Q. Recently after laundering a cotton dress, I found brown spots along the zipper. The zipper itself appeared as usual. The spots do not seem to be rust, but I would like to find out just what they may be.

A. The U. S. Department of Agriculture answers this by saying that there are on the market zippers made from two metals. While the dress is wet, a chemical process called electrolysis takes place, giving off acid which will damage the fabric. When a hot iron is applied, these brown spots will appear. To be safe, read directions and labels carefully in order to avoid this trouble.

Q. My attention was recently called to *Challa Cloth*. Can you give me some of the highpoints of this material?

A. The Swiss have made this fabric for years and have sold it in the foreign markets. It is now being imported here and is being used chiefly for men's shirts, but will find other uses very soon. Challa is a combination of Australian lamb's wool of the merino type and long staple, high quality Egyptian cotton staple. The fabric is washable and non-shrinkable. Should any garment shrink (and the manufacturers say that there is no instance of this as far as they know), there will be a replacement without question. The material has good wearing qualities, lightness, and warmth and does not irritate the skin.

Q. Why will a rug cushion placed under a new rug "more than double the life of the rug," as claimed by some sellers? It does seem to me that the same amount of wear is placed on the rug whether or not there is a cushion underneath. Can you explain the claim?

A. Every footfall on a rug has a wearing effect, however slight, on not only the top of the rug but also on the underside where it rubs against the floor beneath. In addition, every yarn under pressure is flexed throughout the construction. Obviously, a soft cushion under this pressure will help all the hidden portions of the rug better to take the punishment.

Q. I have been hearing much about a *taffetized* fabric. Can you tell me something about this material?

A. A taffetized fabric is crisp to the touch because a lacquer has been applied to the surface. A light application gives only a slightly crisp, flexible hand to the goods; a heavier application provides more stiffness and adds considerable rustle. Some of the finishes used are durable while others may disappear during cleaning. If a slight rubbing between the fingers disturbs the finish to the eye, it means that the finish will not be permanent. It would be wise to ask for a guarantee of permanence.

Q. What exactly is meant by a *true bias?*

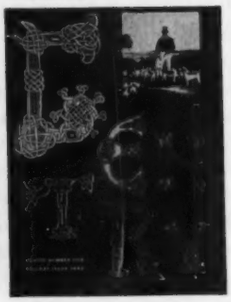
A. An accepted definition of a true bias is this: It is a line on a material which runs diagonally from the points of a square. To find the true bias in a fabric, fold the goods diagonally so that the filling or crosswise threads lie parallel with the warp or lengthwise threads.

Incidentally, cutting fabric at a 45-degree angle provides the *give* for a smooth fit and movement. Also, in cutting a skirt, the yardage at the hem is added with a narrow section at the waist. Bias seams should be *stayed* or held in place with seam binding to prevent stretching. Be careful in buying ready-made garments, to examine the bias cut claims since many so-called bias-cut garments are merely cut slightly off-straight, and will not give the benefit of a true bias.

Q. Is there anything that can be done about crinoline stiffening at the bottom of petticoats to prevent snagging the stockings?

A. We suggest that you sew a facing to the stiffening before you incorporate it into the underskirt.

His Master's Choice



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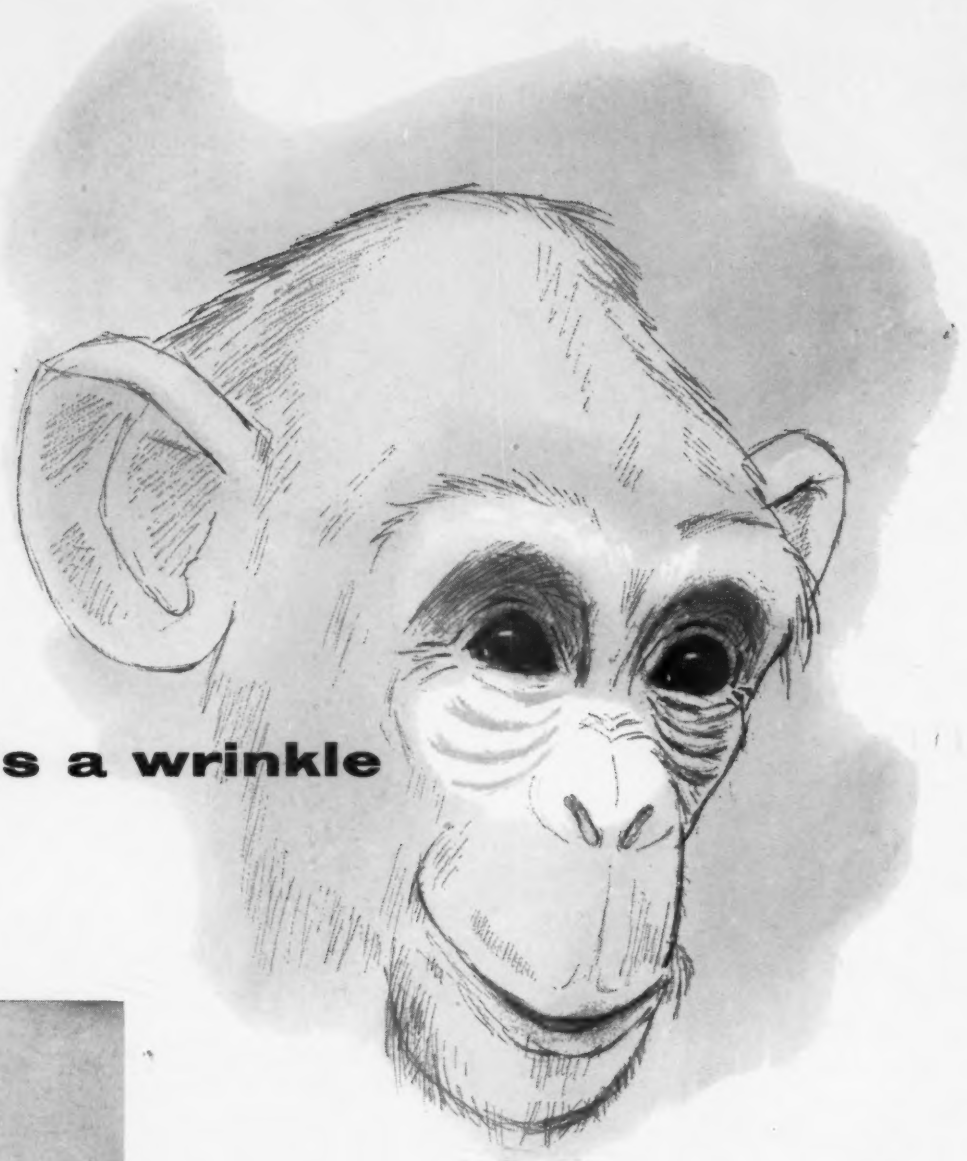

This is a wrinkle

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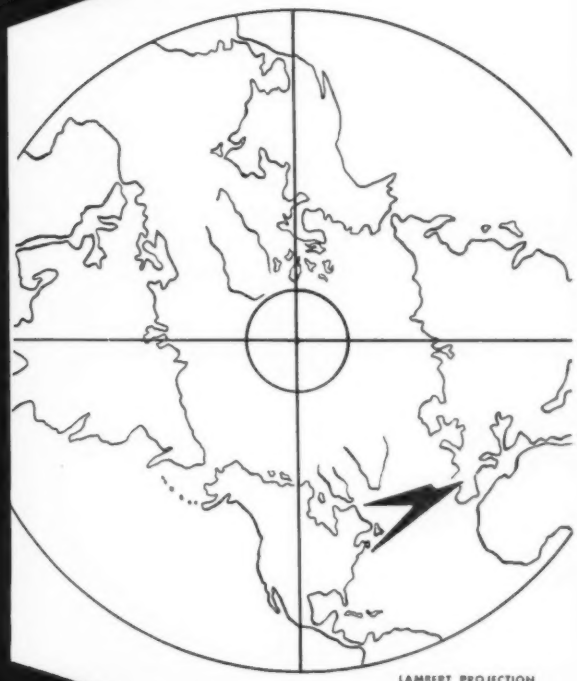
ROUND *the* WORLD WARDROBE GUIDE



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APPAREL BASICS

any time...any climate...round-the-world

To choose a wardrobe for air-minded men, suited to a variety of countries and climates, requires knowledge and experience. In compiling this Round-the-World Wardrobe Guide, Gentry's fashion editors took into consideration not only factors of comfort and convenience, but also those of correctness in regard to the widely varying social and business customs of a number of different countries and locales. Saks Fifth Avenue, with its wide background in outfitting travelers to all parts of the world, was eminently suited to assemble the actual wardrobe, and it was from the store's workrooms and ready-to-wear departments that the merchandise was selected.

After the selection of the wardrobe luggage, the apparel, and the accessories, the next step was their testing and checking in different countries and climates around the world. Here, too, the advantage of the British Overseas Airways Corporation's globe-encircling facilities were obvious, and it was through B.O.A.C. cooperation that the actual wardrobe-testing was made possible. In London and Rome, in Cairo and Calcutta the wardrobe proved its travel-comfort and fashion-correctness, and it is on the basis of actual performance that the following information and charts are presented.

THE BASIC OUTER COAT: A single-breasted topcoat tailored from medium weight gabardine equipped with a removable wool lining. If chosen in dark blue it can serve for any informal or formal occasion . . . as a raincoat when necessary. A good model choice is pictured left (optional second coat, D.B. polo model in tan camel hair). The semi-sport hat (one of two suggested) adequately takes care of headwear for all but dressy occasions. The dark brown moccasin last shoes are one pair from the suggested four.

Miscellaneous tips: Include a package of the new plastic bandaids; they come in mighty handy...Carry any and all liquids in plastic containers; they don't break and you'll find they won't leak in high altitudes...Take along sun glasses and eyewash; when you come back from a dusty jaunt somewhere, you'll be grateful...Don't forget the clothes brush...Take a good deodorant.

BASIC SUITS: For general wear or travel except in hot weather zones . . . a dark blue, a dark grey flannel, a conservatively patterned tweed or Shetland in brown or grey. The blue takes care of

If you are going to be in England don't expect to find the same austerity that prevailed a couple of years back. Food is definitely better and more plentiful; so is the service; and a greater variety of merchandise can be found in shops.

business, informal evenings, and can be double-breasted (right) or single-breasted. The grey flannel, preferably single-breasted, is for daytime business and travel. The single-breasted tweed or Shetland is an alternate for business, travel, and visits in the country. Fabrics for all garments can be wool, certain of the new man-made fibers, or blends of both, the latter having worthwhile wrinkle-resisting, soil-preventing characteristics. A dark hat (preferably navy, allowing additional use for formal wear) — Homburg (sketched) or snap brim — will take care of business and in-town activities. Black shoes in town-last, illustrated, and style shown above adequately take care of shoe wardrobe for all but sports and formal activities.

The surest way to be spotted as an American tourist is to wear flashy clothes. So guide yourself accordingly!

BASIC HOT WEATHER SUITS: If your travels take you to hot as well as moderate and cold weather zones, then include an additional lightweight suit. Because of its wrinkle-resistance, quick-drying, and light weight, a suit tailored from a corded fabric that blends Orlon with other fibers (sketched right) in grey or tan is a wise choice. If trip is made only in hot weather, utilize color suggestions contained on previous page, substitute tropical weight fabrics made from silk, worsted, linen, Dacron, or blends, and confine models to single-breasted versions. Coconut straw hat (substitute for felts) and dark brown tassel moccasin shoes sketched can properly accessorize all such garments for any occasion.

BASIC SPECTATOR SPORTS CLOTHES: Expect in hot weather zones or during hot seasons you can adequately take care of apparel for spectator sports and weekends in the country by including flannel slacks. Since these would be worn with coat from tweed or Shetland suit to form the ensemble at left, choose slacks in a complimentary color. Dark grey is most versatile in that it properly blends with both brown or grey coats. The hat is the same one, blocked differently, as that shown with topcoat (opposite page). Shoes are again the versatile tassel moccasins. The necessary sweater should be sleeveless, of medium weight, in a neutral shade (preferably tan) of a soft yarn like cashmere.

Be sure to take your shoes off on a prolonged trip, especially at night. This will keep your feet from swelling.

The choice of materials that *travel* well is naturally important on a round the world trip. The new Orlon and acetate suit (a Robbins Mills fabric) packed well and was practically wrinkle-free even in the hottest zones. See reference sample.

(please turn)

If you use an electric razor, secure an International shaving kit which will convert it for use on all currents, and all outlets. Consult the manufacturer that made your razor for this equipment. It's also good to take an extension cord.

BASIC FORMAL ATTIRE: Regardless of the time of year or the climates to be visited, the most versatile choice is a single-breasted Tuxedo (left) in midnight blue or black, tailored from lightweight worsted, silk, man-made fiber fabrics, or blends. Tailoring details can include self or dull satin lapels. Necessary accessories . . . bow tie and cummerbund (black or midnight blue); black patent leather Oxfords, pumps, or tassel moccasins. If major part of time is to be spent in hot weather zones and you intend to dress frequently, it might be wise to take an additional white dinner jacket tailored from any of the fabrics mentioned and include tie and cummerbund of India madras plaid or African batik.

In packing, keep right on top the things you will use most frequently. After awhile you'll find you can pack better than you could at the beginning.

BASICS FOR VACATION TRAVEL in warm weather zones: In most cases casual sportswear makes up the bulk of your packable luggage in that a matching suit in solid color tailored from lightweight fabric can be worn enroute. Keep in mind colors that blend or contrast in choosing coats and slacks, thereby getting the most out of a minimum number of garments. Wardrobes should include two solid color odd coats or blazers of lightweight linen, silk, wool flannel, or man-made fiber fabrics. Dark blue, white, most versatile. Slacks (4) tailored from the same fabrics as above should include colors like yellow, faded blue, red, green; basic colors like white, navy, natural tan. Utilize high colors for daytime with sport shirts as shown right. Footwear shown is the tassel moccasin.

Comfortable shoes are vital. It is a good idea to make sure that any shoes you take with you are well broken in before you start the trip. You are going to do a lot of walking, sightseeing, etc.

You always have to figure on bringing home lots of souvenirs and knicknacks. Remember it is more convenient to send things back, rather than lug them with you.

VACATION TRAVEL (*cont'd*): Shorts are a worthwhile addition to regulation slacks, especially if travels take you to the tropics. Choose them in the slack fabrics previously mentioned, additional choices include cotton twill or denim. Best colors . . . tan, faded blue, white. To ensemble with them . . . knee-length wool or cotton lisle hose (they add to appearance and comfort) as shown right are advised. Sport shirts in cotton or silk are an important part of the kit. Include solid colors in button-front style, as worn here, and knit slipovers. Assortments should also include simple pattern types. Ground colors are the same as those suggested for coats and slacks.

Be prepared would be a good watchword for anyone going on a round-the-world trip. This means watching your health, your diet, taking care of yourself. In the far-off places of the world stomach trouble is more than a joke. One of the tested remedies which seasoned travelers have discovered is entero-vioform, which can be bought only outside the United States. You need a prescription for paregoric and other remedies, but not for entero- vioform.

ACTIVE SPORTSWEAR for southern zones: The slacks, shirts, and spectator sports items previously described adequately take care of major clothing items unless you plan to participate in sports which require specific functional apparel (hunting, fishing, etc.). Beachwear should include a minimum of two pairs of swim trunks, solid color or patterned, and a garment made of water-absorbing fabric to cover the upper part of the body. One type is the coat-shirt as shown right. Also include beach espadrilles of canvas like those sketched, or other lightweight type.

ACCESSORIES: Generally speaking, items should be the same as you would choose for similar climates and activities at home. To travel with the minimum amount, consider shirts and pajamas made from Dacron, Orlon, or nylon because they dry fast, require no pressing. Three shirts and one pair of pajamas of these types should be adequate for a two weeks' trip.

Check with airlines officials for health regulations and required certificates in each country. On returning, you of course need a U.S. health vaccination certificate.

IN ORDER TO BE MORE SPECIFIC ABOUT THESE MISCELLANEOUS ITEMS . . . TO GIVE ADDITIONAL INFORMATION OR OPTIONAL CHOICES OF MAJOR ITEMS . . . WE HAVE COMPILED ON THE FOLLOWING PAGES A CHART WHICH WE HOPE WILL BE HELPFUL TO YOU IN TRAVELING LIGHT AND TRAVELING CLOTHES-RIGHT.

WARDROBE GUIDE

	A **VACATION** *Hot Climates*	B **BUSINESS — PLEASURE** *Temperate Zones* *Spring and Summer*	**BUS**
OUTER COATS	RAINCOAT: Lightweight cotton; single-breasted, fly-front, or button through; slash pockets; tan, navy blue.	SPRING TOPCOAT: Wool gabardine; S. B.; navy blue, tan. D. B. camel hair polo coat; tan. Raincoat, same as column A or D. B. trench; cotton, wool gabardine; removable lining. SUMMER: Same as column A.	Wool wool polo COAT remo
SUITS	Silk, linen, cotton, wool, man-mades, blends, in tropical weights. Lightweight flannel, gabardine. Dark blue, dark brown, natural tan, white. All in S.B. models.	SPRING: Wool, man-mades, blends. Flannels, worsteds; S.B., D.B.; navy blue, medium grey, brown. Tweeds, Shetlands; S. B.; simple patterns; brown, grey. SUMMER: Same as column A.	Woo D.B. ticwe Shetl
ODD COATS	Silk, linen, cotton, man-mades, blends; navy, white, faded blue, high colors. Lightweight wool or blended Shetland types; simple patterns; brown, tan, grey. Single-breasted models. Lightweight navy blue flannel blazer, S.B., D.B.	SPRING: Navy blue wool flannel blazer; S.B., D.B. Wool blends; tweeds, Shetlands; S.B.; simple herringbone, check; brown, grey. SUMMER: Same as column A.	Wool, nels; S dark b
SLACKS	Linen, silk, cotton, man-mades, blends. Colors as in coats above plus reds, yellows, greens. Wool or blended fiber flannels in greys. Wool gabardine, tropical worsteds; colors as above.	SPRING: Wool, blends; flannel, gabardine; medium dark shades of grey, brown, tan. SUMMER: Same as column A.	Wool, brown whipc
FORMAL WEAR	S.B. Tuxedo in silk, tropical worsted, blends, man-mades. Midnight blue, black. Dinner jacket, white; trousers, midnight blue, black; fabrics as above.	SPRING: S. B. Tuxedo: silk, tropical worsted, blends, man-mades; midnight blue, black. OPTIONAL SUMMER: White dinner jacket; midnight trousers.	TUXE satin dium midni
SHIRTS	Lightweight batistes, oxfords, broadcloths; cotton, Dacron, Orlon fabrics. Modified spread, vanishing band, button-down collars; long sleeves. White, colors. Formal shirt: soft pleat, cotton or silk.	SPRING: Broadcloth, oxford, madras; cotton, Dacron, Orlon. Spread, rounded-point, button-down collars. White, colors. FORMAL AND SUMMER: See Column A.	Broa Dacr roun Whi check
SPORT SHIRTS	Cotton, silk, rayon; moderate length point collars, short sleeves; solid colors. Same fabrics, neat checks, plaids, neat prints. Knit cottons, wool, blends; slipover styles, neck placket, collar, short sleeves.	SPRING: Knit wool, part wool, cotton; slipover with collar; long, short sleeves; solid dark colors. Medium weight; wool, part wool, man-mades; solids, plaids. SUMMER: Same as column A.	Knit colla Woo chall
ACCESSORIES 	NECKWEAR: Cotton, silk; light or dark grounds; stripes, plaids, neat patterns; four-in-hands, bows. PAJAMAS: Cotton, Dacron, Orlon. SHORTS: Cotton, Dacron, Orlon. SOCKS: Cotton, lisle, wool, man-mades, blends; ankle lengths; solid dark, pastel colors, fancies. ROBE: Lightweight cotton, silk. FOR DRESS: Bow tie and cummerbund to match trousers; black hose, silk, nylon; suspenders, jewelry.	SPRING NECKWEAR: Silk, wool; medium dark grounds; stripes, plaids, neat patterns; four-in-hands, bows. SOCKS: lisle, wool, man-mades, blends; solid dark colors, fancies. Pajamas, undershirts, shorts, handkerchiefs and *For Dress* same as column A. SUMMER: Use complete list of items in column A instead of above.	NEC grou four- man- fanci wool less; silk Paja chief
FOOTWEAR	TASSEL MOCCASIN SHOES: Dark brown, black. FABRIC SHOES: Leather, rubber soles; white, blue, tan. DRESS: Patent Oxfords, tassel moccasins, pumps. Beach shoes. Slippers.	SPRING: Oxfords; smooth leathers; simple details, moderate-width soles; brown, black. Tassel moccasins; brown, black. Slippers. DRESS AND SUMMER: Same as column A.	Oxfo ple brow Tass DRE
HEADWEAR	HAT: Coconut straw; telescope crown; dark brown; solid, print puggree band. CAP: Linen, cotton, lightweight wool; white, solid colors.	SPRING FELT HATS: snap brim, Homburg; navy, dark brown, grey. Semi-sport shape; dark brown, green. Wool cap; solid, pattern. SUMMER: See column A.	FELT blue brow
MISCELLANEOUS	WALKING SHORTS: Cotton, linen, silk, man-mades; knee-length; tan, white, solid colors. SPORT BELTS: Woven elastic, silk ribbon, leather, cotton; solid colors, patterns. SWEATERS: Lightweight, sleeveless Cashmere; neutral solid shade. SWIM TRUNKS: waistband, boxer style; solid colors, patterns. BEACH UPPER: Coat shirt; knee-length, full-length. ROBE: Cotton, terry cloth, ratine; solid colors, stripes, prints.	SPRING: SWEATERS: Medium weight; wool, cashmere, blends; sleeveless, sleeves; solid medium-dark colors. BELTS: leather, woven elastic. SUSPENDERS: elastic, ribbon. ROBE: lightweight wool challis, flannel; solid, patterned. ODD VESTS: solids, checks, tartans; medium dark tones (checks also, white grounds). Lightweight water-repellent jacket; cottons, man-mades; tan. SUMMER: Same as column A.	BELT ODD tarta patte othe leath woo FLEE woo lent mad

C

BUSINESS — PLEASURE

Temperate Zones
Fall and Winter

D

BUSINESS — PLEASURE

Cold Climates

Wool gabardine, covert; S.B.; removable wool lining; navy, tan. D.B. camel hair polo coat; removable lining; tan. RAINCOAT: D.B. trench; cotton, wool, blends; removable lining; tan.	Wool tweed; D.B.; removable or attached pile lining; simple pattern; brown, grey. Same as above in wool gabardine; dark tan. OVERCOAT: wool; S.B., D.B.; navy, oxford. RAINCOAT: See Column C.
Wool, blends. Flannels, worsteds; S.B., D.B.; navy blue, dark grey, brown; solids, ticweaves, sharkskins, stripes. Tweeds, Shetlands; S.B.; patterns; brown, grey.	Wool, blends. Flannels, worsteds; S.B., D.B.; navy blue, dark grey, brown; solids, ticweaves, sharkskins, stripes. Tweeds, Shetlands; S.B.; patterns; brown, grey.
Wool, blends; tweeds, Shetlands; flannels; S. B.; herringbones, checks, plaids; dark browns, greys.	Wool, blends; tweeds, Shetlands; flannels; S. B.; herringbones, checks, plaids; dark browns, greys.
Wool, blends; dark grey flannel; dark brown gabardine; dark natural covert, whipcord. Heavy corduroy, dark colors.	Wool, blends; dark grey flannel; dark brown gabardine; dark natural covert, whipcord. Heavy corduroy, dark colors.
TUXEDO: S.B.; self, satin shawl collar or satin peak lapels. Silk, tropical, or medium weight worsted, blends, man-mades; midnight blue, black.	TUXEDO: S.B.; self, satin shawl collar; satin peak lapels. Silk, tropical, or medium weight worsted, blends, man-mades; midnight blue, black.
Broadcloth, madras, oxford; cotton, Dacron, Orlon, nylon fabrics. Spread, rounded-point, button-down, tab collars. White, solid colors; colored neat stripes, checks. FORMAL: Same as column A.	Broadcloth, madras, oxford; cotton, Dacron, Orlon, nylon fabrics. Spread, rounded-point, button-down, tab collars. White, solid colors; colored neat stripes, checks. FORMAL: Same as column A.
Knits; wool, part wool; slipover with collar; long sleeves; solid dark colors. Wool, part wool, man-mades; flannels, challis; solids, tartans, checks.	Heavyweight wool flannel; button front; solid dark, high colors, tartans, checks. Knits; wool; slipover with collar; long sleeves. Medium weight wool, part wool, man-mades; flannels, challis.
NECKWEAR: Silk, wool; dark, medium grounds; stripes, plaids, neat patterns; four-in-hands, bows. SOCKS: lisle, wool, man-mades; blends; solid dark colors, fancies. SWEATERS: Medium weight; wool, cashmere, blends; sleeves, sleeveless; solid, medium dark colors. ROBE: silk foulard, lightweight flannel, challis. Pajamas, undershirts, shorts, handkerchiefs and *For Dress* same as column A.	NECKWEAR: Silk, wool; dark, medium grounds; stripes, plaids, neat patterns; four-in-hands, bows. SOCKS: Lisle, wool, blends; solid dark colors, fancies. SWEATERS: Medium weight; wool, cashmere, blends; sleeves; solid, medium dark colors. ROBE: silk foulard, wool challis, medium weight flannel. PAJAMAS: Cotton, Dacron, Orlon, flannelette. Undershirts, shorts, handkerchiefs, and *For Dress*, same as column A.
Oxfords; smooth, brushed leathers; simple details, moderate width soles; dark brown; black (smooth leather only). Tassel moccasins; brown. Slippers. DRESS: Same as column A.	OXFORDS: Same as column C. Tassel moccasin; smooth leather; dark brown. Conventional moccasin, chukka; shearling lined; brown. SLIPPERS: shearling lined. DRESS: Same as column A.
FELT HATS: Snap brim, Homburg; navy blue, dark brown, grey. Semi-sport shape; brown, green. CAP: wool; solid, pattern.	FELT HATS: Snap brim, Homburg; navy, dark brown, grey. Semi-sport shape; dark brown, green. CAP: wool, solid, pattern; cotton; pile-lined; ear flaps.
BELTS: leather, woven elastic. Suspenders. ODD VESTS: wool, silk; solids, checks, tartans, stripes; solids in medium tones; patterns in white grounds (checks only), others, medium to dark tones. GLOVES: leather; grey mocha, natural pigskin; knit wools; chamois colored cottons. MUFFLER: wool, silk, reversible silk and wool; solids, neat patterns. Water-repellent hip-length jacket; cotton, wool, man-made; medium weight; lined, unlined.	Generally the same as items listed in column C. Additions or substitutions might include: heavyweight sweater; lined leather or fabric gloves. If you expect to participate in winter sports, i.e., skiing, ice skating, etc., include functional clothing for those activities.

* *D.B. — double-breasted*
S.B. — single-breasted

Travel Pointers on the Wing

Jules Verne's hero, Phineas P. Fogg, went around the world in eighty days when traveling required several trunks full of luggage. Today, starting in New York and using the international airlines of the world, you can make the same trip in a fraction of that time — and with only 88 lbs. of baggage. This wardrobe was flight-tested by B.O.A.C., and the project included travel on such other airlines as Qantas Empire Airways, Tasman Empire Airways, British Commonwealth Pacific Airlines, and United Airlines.

As the world grows smaller in air travel, it becomes the businessman's oyster, but don't eat them out of season, no matter where you are.

When in England, as indeed anywhere, try the foods of the country instead of the foods you eat at home. British game such as partridge, pheasant, grouse, is superior to British steak which is hard to find.

Water in other parts of the world is not always as pure as it is here; bottled spring water of named brands throughout the world is a safe bet.

Over-tipping doesn't pay — either you or the traveler who follows you. Between 10% and 15% is usually adequate.

When you visit foreign countries, particularly those which, like India, are in the birth pains of nationhood, it is wise to listen well and talk little.

A hand-written thank-you note is worth several typewritten letters.

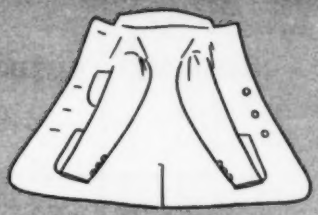
The observance of local customs will win far more friends than the introduction of customs from abroad.

A smile in greeting authorities such as immigration, customs, and health officials will short-cut red tape more than all the arguments that any traveler can conjure up.

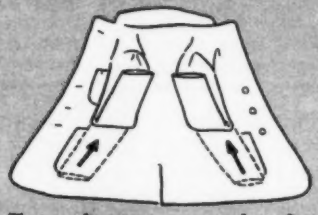
HOW TO FOLD AND PACK . . .

Most apparel items that a man needs to carry with him on a trip are comparatively easy to pack. One exception is the suit coat or sport jacket. If you are traveling with luggage equipped with hangers, as photographed below, it is comparatively simple to pack coats so that they come out with as few wrinkles as possible.

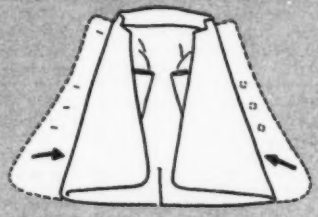
In the event your luggage is not so equipped, we are showing in sketches alongside how you can fold a coat so that it keeps its shape in traveling and comes out of your bag with a minimum of wrinkles. If you are packing a suit, the trousers of the garment can be folded over double and placed between the folds of the coat before (as is indicated in sketch 4) the coat is doubled over for placing into the bag.



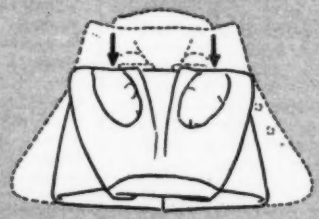
1. Spread coat out on flat surface. Make certain collar is turned up, that sleeves are straight and laid out smoothly, free of wrinkles.



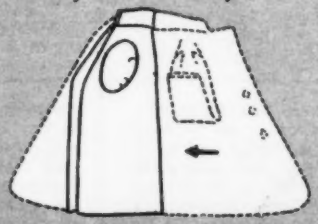
2. Turn sleeves up so that lower portion is about even with armhole when folded. Keep all parts smooth and free of wrinkles.



3. Fold front side parts of coat over sleeves so that edges meet at rear center seam. Smooth out wrinkles.



4. To pack in wide container: Double up over sleeves to top of collar. Pick up at each side of garment, and lay coat smoothly into bag.



5. To pack in duffel bag or narrow container: Smooth out wrinkles, fold left side over right, then bottom to top, and lay flat in bag.

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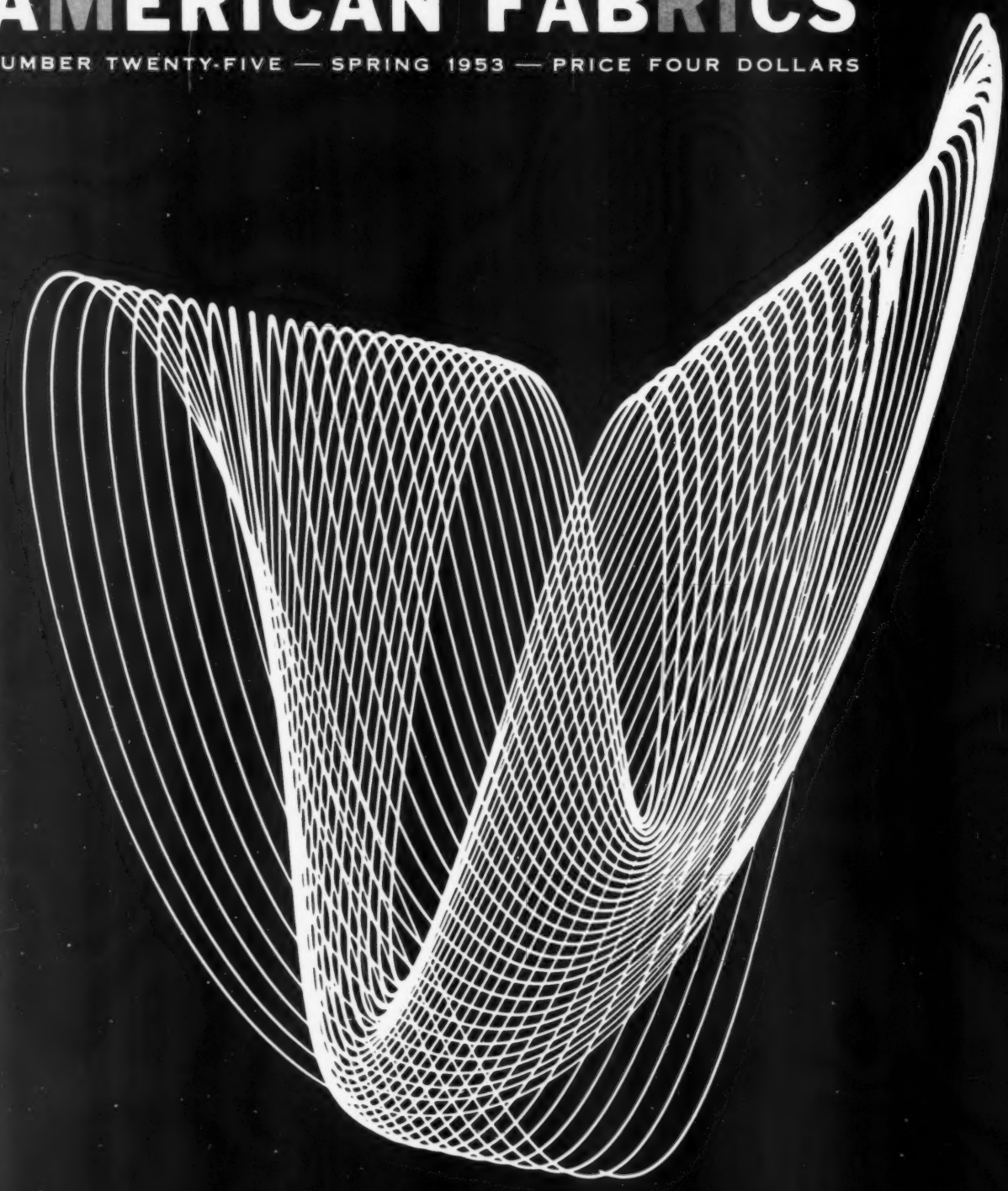

incorporating in this issue

American Industrial Materials